App.F.IX-4

1924.

File No. 113-24

Previous References (LB)

Serial Nos. 1674

Later references.

LB 113-24 to 6

G.S. 266.25/B4

L.B. 137-31 (1-6)

Preserve

GENERAL AND REVENUE SECRETARIAT.

Serial Nos.

Part B for Feb 26.

SUBJECT

Construction of the Kadur-Chikmagalur Railway

---

4 To,

The President, District Bd. Kadur, the Deputy Commissioner, Kadur, the Comptroller & the Chief Engineer for Railways.

No. L 5728-31/d 20-2-1926

Sanctions the Construction of the Kadur-Chikmagalur Railway as a Govt. line on the terms agreed upon by the Kadur District Board

MS
20.B.26.

GENERAL AND REVENUE SECRETARIAT.

(L. B.)

NOTES.

File No. 113-24

FILE HEADING.

Construction of Railway between Kadur and Chickmagalur

From

The Dy. Comr, Kadur Distt

No. 488 L.B./24-25 Dated 16th March 25 Received 19. 3. 1925.

Diary No.	L. 5933	Enclos. 2	Spare Copies.	Serial No. 1

BRIEF ABSTRACT OF LETTER.

Forwards the resolution of the Kadur Distt Board in the matter of the construction of a Railway line from Kadur to Chickmagalur requesting the Govt may be moved to direct the construction of the line & graciously make a grant to the Distt Board of half the cost of the line viz Rs 12 lakhs, the remaining half being found by the Distt Board.

NOTES AND ORDERS.

1) The Dy. Comr states that

2) (1) the amount of Rs 4,42,762 at the credit of the Board at the end of June 1925 will be Rs 4,42,762 and the amount available for being handed over to Govt for the construction of the line on

General and Revenue Secretariat. | L.B. File No. 113 of 1924

Serial No.

30th June 1926 will be Rs 5,10,000.

2) (2) that the Board requests sanction to the raising of a debenture loan repayable in 10 to 30 years of 7 lakhs at 7 per cent interest per annum.

3) (3) that the Board proposes to set apart the entire net earnings of the line estimated at Rs 26,000 a year for the formation of a Sinking Fund to repayment the loan as early as practicable and to pay interest amounting at Rs 1,19,000 annually to the debenture holders from the proceeds of the Railway Cess, the interest on the loan being the first charge on the R.C. collections

4) (4) that the cost of the construction of the new gauge line from Nadur to Chickmagalur according to the estimate prepared in 1921 is Rs. 29,09,958. The Sub Committee believe that in view of the drop in prices of iron, timber and other materials and the substitution of 50 and 60 lbs rails by 41½ lbs throughout it is possible to reduce the cost to Rs. 24,00,000 and that the Distt Board will be in a position to finance it only if they secure from the Govt a grant of a moiety of the cost of the construction.

5933

3

5) Subd for orders
wks 3/4. 3 4 25 6) L. L Rly)
7) 2nd Member

Serial No.

DEWAN'S OFFICE
RECD. ON 7. APR. 1925
Reg. No. 7519

8070
6/4

5) The Railway Secretariat
made Considered about the
Cost & execution & the fair
Level about the proposed
Contribution of half the Cost
by Govt Half the Cost is
too large an order, but in view
of the importance of general
of the Railway a Substantial
free grant may, I think, be
made, provided the Dir
Roads could show ways &
means for the for paying out of
& repaying Capital, in them
20 or 30 years. I think, be floated at 6½
the loan may now

raised by loan

8) Dewan

7/4/25

1) Reception
remarks

7/4

10) Fwd Secy
with Compts

11) 8/4
9.4

12) Secy 12/4/25

7L 2288/24

NOTE—Contn. Sheet

Serial No.

13) The conditions on which this line can be taken up are the following:-

14) (1) The District Board should itself find the whole capital. It is not possible for Government, with their commitments, to spare any money out of their very limited capital resources for becoming partners in this Concern. The District Board wants Government to make a free gift of half the capital of this line; vide, paras 10 and 11 of the President's letter. Government cannot afford to make any such contribution; nor, is it justifiable that a subsidy should be given by Government for a capital asset of the District Board created for earning revenue for the latter. The provision by Government of capital or revenue funds for this line is not possible.

15) (2) The District Board should have sufficient annual revenue from Cess collection to meet the entire demand on account of interest on the loan raised for constructing the line. Government may agree to be Guarantors but there should be a Guarantee Fund created from the finances of the Board to prevent any liability being thrown upon Government.

16) If the above two conditions can be satisfied, the question may be taken up for further consideration. There are also two more points to be considered viz., (i) possibilities of loss on working and (ii) provision for repayment of loan.

NOTE-Contn. Sheet

If the traffic prospects of the line are not discouraging, the risk involved in point No.(i) need not deter the District Board from taking up the line. As regards point No.(ii), it need not stand in the way of this concern being undertaken as, if adequate provision for a Sinking Fund cannot be made from the net earnings of the line, the deficiency could be met from a new loan or otherwise.

Serial No.

A 2288

Submitted with regret to the Dewan's orders in para 9 of the notes for orders

DEWAN'S OFFICE. RECD. ON 9. MAY 1925. Reg. No. 8311

95-63

Serial No.

21) Forwarded to the A.S. Secretariat for favour of furnishing information as to the Cost of the scheme as required in para 8 & 15 of the note above.

By order,
for Secretary to Govt.
Law Dept.

28/5/25

22 The cost and execution of Kadur-Chickmagalur Ry. is noted below:-

Particulars.	Metre Gauge. Without rolling stock. Working Expenses 65% (1)	Metre Gauge. With rolling stock. Working Expenses 65%. (2)	2'-6" Gauge with rolling stock. Working Expenses 70% of receipts. (3)	2 Ft. Gauge with rolling stock. Working Expenses 75% of receipts. (4)
1. Total Capital cost.	Rs. 18,69,333	22,15,173	17,74,842	13,82,908
2. Cost per mile.	64,862	76,862	61,583	47,984
3. Total earnings expected. ...	63,623	63,623	63,623	63,623
4. Deduct Working Expenses. ...	41,354	41,354	44,536	47,717
5. Deduct hire of rolling stock at 5% of gross receipts.	3,181			
6. Net Revenue. ...	19,088	22,269	19,087	15,906
7. Return on Capital cost. ...	1.02%	1.005%	1.08%	1.15%

23) In (1) it is assumed that the M & S may also provide rolling stock at 5% of gross receipts. We have no rolling stock available.

As the narrow gauges are more expensive to work than the metre the ratio of expenses to earnings is proportionately increased

10/8/25

06794

11 AUG. 1925

NOTE—Contd. sheet.

GPE—65,000—17-C-12.

R.O. 140 dt 10/8/25

Secretary Local & Leg. Depts.

File No. of 19 General and Revenue Secretariat.

Serial No.

U. O. No. 426 (3 such as one of this file of papers) dated 23rd July 1925

KADUR - CHICKMAGALUR RAILWAY.-

R.

Your U.O. No. 140 dated 15-6-'25.

62/G7

23-JUL-1925 188 Diary TNZ

Paras 8 and 19 of the notes of the Local and Legislative Secretariat regarding present cost of the above line.

The question was discussed with you. Alternative estimates for the line for all the three gauges - metre, 2 ft. 6 in and 2 feet - are prepared and put up, showing the estimated working expenses and percentage of net earnings in all the three cases.

Engineer-in-Chief.

Railway Secretary).

Submit with reference to the memo from the Secy: Local & Legis. Deptt.

14-7-25

KADUR CHICKMAGALUR RAILWAY.-

Gauge - Metre.

Length 28.82 Miles.

Cost of the project excluding cost of land only providing second hand rails and fastenings works out to Rs 22,15,173

Rate per Mile Rs 76,862.

Total Earnings expected	Rs	63,623
Deduct Working expenses ay 65% of Earnings.		41,354
Net Revenue	Rs	22,269

Percentage of profit 1.005 %

Engineer-in-Chief,
Mysore Railways.

KADUR-CHICKMAGALUR RAILWAY.-

Metre Gauge.

Length .. 28.82 Miles.

Cost of the project excluding cost of land and Rolling stock providing second hand rails and fastenings works out to		Rs 18,69,333
Per Mile Rs 64,862/-		
Total earnings expected	Rs	63,623
Deduct working expenses at 65% of earnings	Rs	41,354
Net Revenue	Rs	22,269

Percentage of profit 1.2 %

which barely suffices to pay interest on Capital outlay.

Engineer-in-Chief,
Mysore Railways.

KADUR-CHICKMAGALUR RAILWAY.

2'-6" Gauge.

Length .. 28.82 Miles.

Cost of the project excluding cost of land providing second hand rails and fastenings works out to Rs 17,74,842

Per Mile Rs 61,583.

Total Earnings expected Rs 63,623

Deduct Working expenses at 65% of earnings Rs 41,354

Net Revenue Rs 22,269

Percentage of Profit 1·25%.

which barely suffices to pay interest on Capital outlay.

Engineer-in-Chief,
Mysore Railways.

K.S.

2 feet 6 inch Gauge. Kadur - Chickmagalur Railway. Length 28.82 Miles.

General Abstract of Cost.

Sl. No.	Heads of Account.	Main head		Remarks.
		Amount.	Rate per mile.	
		Rs.	Rs.	
I.	Preliminary Expenses.	30,261	1050	
II.	L a n d.	"	"	
III.	Formation.	3,75,525	13,030	
IV	B r i d g e s.	1,80,326	6257	
V	F e n c i n g.	22,508	781	
VI	Electric Telegraph.	"	"	
VII	Ballast and permanent way.	5,69,648	19,765	
VIII	Stations and Buildings.	1,72,920	6,000	
IX	P l a n t.	28,820	1,000	
X	Ferries etc.	"	"	
XI	Rolling stock.	2,30,560	8,000	
XII	General charges.	1,64,274	5700	
	Grand Total Rs.	17,74,842	61,583.	

Engineer-in-Chief,
Mysore Railways.

KADUR-CHICKMAGALUR RAILWAY.

2'-0"...Gauge.

Length .. 28.82 miles.

Cost of the project excluding cost of land providing second hand rails and fastenings works out to R 13,82,908

Per Mile R 47,984.

Total Earnings expected R 63,623

Deduct Working expenses at 65% of earnings R 41,354

Net Revenue R 22,269

Percentage of Profit 1·61%.

Which barely suffices to pay interest on Capital outlay.

Engineer-in-Chief,
Mysore Railways.

A.S.

.2 feet. Gauge. Kadur - Chickmagalur Railway. Length 28.82 Miles.

General Abstract of Cost.

Sl. No.	Heads of Account.	Main Head		Remarks.
		Amount.	Rate per Mile.	
		Rs	Rs	
I.	Preliminary Expenses.	30,261	1,050	
II.	L a n d.	-	-	
III.	Formation.	3,74,660	13,000	
IV	B r i d g e s.	1,44,100	5,000	
V	F e n c i n g.	17,292	600	
VI	Electric Telegraph.		-	
VII	Ballast and permanent way.	3,12,245	10,834	
VIII	Stations and Buildings.	1,72,920	6,000	
IX	P l a n t.	25,938	900	
X	Ferries etc.	"	"	
XI	Rolling stock.	1,72,920	6000	
XII	General charges.	1,32,572	4600	
	Grand Total Rs	13,82,908	47,984	

Engineer-in-Chief,
Mysore Railways.

5933/25

W D 02219—GPB—3,000—2-11-22

Railway Secretariat | 25 File No. 113 of 1924

7

Serial No.

24- Rly Secy's note & Draft with reference to para 2 above

HMK
12/8/25 (2nd Member) 22/8/25.

1433
14/8
DEWAN'S OFFICE.
Recd on 18. AUG. 1925
Reg. No. 15GL

25 Please submit this to Dewan.

26 The question may be considered along with my note on Dir Board Railways. The Rly does not seem like a peripatone.

Lee
17/8/25

27 Dewan

84
18/8

Rly Secy considered in C

67
3.8

Chief Secy with Compts

8.8.
2-9
28

Recd 4.45 PM 8/9/25

5/11

Second Member's Note on Dir Board Rly was Considered in Council yesterday. May this file be linked to it or Circulated Separately for Consideration in Council?

HS
8/9/25

Memo of representation from the people of Chickmagalur with Dewan's orders of 7/9/25 is also linked herewith

HS
7/9/25

(For Disposal at a Meeting)

No. C. 126
of 1925-6.

GENERAL AND REVENUE SECRETARIAT.

Council Matter.

SUBJECT.

(Clauses xii & xx of the Schedule)

Construction of Kadur-Chickmagalur Railway Line.

CIRCULATED TO THE MEMBERS OF COUNCIL.

By Order,

5th September 1925.

Chief Secretary to Government.

Extraordinary Member of Council.

First Member of Council.

Second Member of Council.

Extra Member of Council.

C 126

Extract from the Proceedings of the 754th *Meeting of the Council of His Highness the Maharaja, held at Bangalore on the* 22nd October *1925.*

---

69. Subject - Clause xii of the Schedule.

Construction of Kadur-Chickmagalur Railway Line.

OPINION OF THE COUNCIL.

The District Board may be requested to intimate whether they are willing to pay to the Government the accumulated surplus of the Railway Cess to meet part of the cost of construction and continue to levy the cess and make it over to Government to meet the losses in working for a period of 25 years. The Line will be constructed as a Government Line.

The M. & S. M. Railway to be asked whether they are prepared to work this line and if so, on what terms, so long as the Kadur-Bangalore Section is worked by them.

Sd/- A.R.Banerji,

Dewan of Mysore.

"EXTRACT"

Chief Secretary to Government.

WD 433—GPB—1,000—1-9-20

Submitted to His Highness.

The question of the construction of a railway line from Kadur to Chickmagalur has been urged on the attention of the Government for the past 25 years. With a view to enable a Fund being built up to meet the cost of this line the District Board have been levying a railway cess of 6 pies in the rupee since the year 1916-17. The realizations by means of the railway cess at the credit of the District Board with the accumulated interest thereon was Rs.3,84,614 at the end of June 1924 and the amount is expected to be Rs.5,10,000 by the end of June 1926. This has also been the subject of special representations to several successive Dewans when they visited the District and was also urged before me. An influential local Committee was deputed to interview me and obtain Government support to the scheme recently.

2. The District Board have offered to allow the accumulated balance at the credit of the railway cess fund to be utilised towards the construction of the line and provide the balance up to a limit of half the expenditure, the other half of the cost being given as a grant by Government. The total cost of the line ~~ex~~clusive of the rolling stock is estimated at Rs.22,15,173/- and without rolling stock the total capital cost will be Rs.18,69,332/- for a metre gauge line. The line is expected to yield a net revenue of about Rs.20,000 and the annual realization from the railway cess now amounts to Rs.56,000 and both these items come approximately to about Rs.75,000. As the District Board have already about 5 lakhs at their credit another 14 lakhs will be required to meet the balance of the cost of the line without the rolling stock.

K

L

Page 6 ; office Note

3. The Railway Secretary is of opinion that it will be

more economical to transfer the working of the line after construction to the Madras and Southern Mahratta Railway who charge a hire of 5 per cent on the gross receipts of rolling stock so long as they continue to work Kadur-Bangalore line, as it would not be necessary in that case to buy rolling stock and we shall in this way be able to reduce the capital cost by nearly 4 lakhs of rupees.

4. There is at present no uniformity in regard to the system followed as to the conditions on which the District Boards are allowed to take part in the construction of railway lines in the State. In some cases for instance in the Kolar District they are treated as part proprietors. The District Boards are not able to find the entire cost necessary for construction of railways from their own resources. In the majority of cases even the portion of the cost promised by them has to be raised by means of a loan, on which the interest has to be guaranteed by Government.

5. The Government of India have recently abolished the system of having separate branch lines constructed by independent local agencies. New extensions are treated as belonging to Government taking the co-operation of the District Board only in case of lines which though not remunerative on railway earnings are required to be constructed for purely local reasons for the development of the particular area. In such cases the local authority guarantees the Railway Board against loss by consenting to make up the difference between the net earnings and the interest and other charges payable.

6. The question of the policy to be adopted as regards allowing District Boards to participate in the development of railways is separately under consideration. The question is complicated by the fact that special arrangements have been made with the different District Boards and

and each case was therefore dealt with on its own merits.

In any case it does not seem to be desirable in the case of future railways to convey any proprietory rights to such lines to the Local Boards.

The larger question is under consideration separately. Meanwhile the following resolution of the Council as regards the Kadur-Chickmagalur line may be graciously approved:-

"The District Board may be requested to intimate whether they are willing to pay the Government the accumulated surplus of the railway cess to meet part of the cost of construction and continue to levy the cess and make it over to Government to meet the losses in working for a period of 25 years. The line will be constructed as a Government line.

"The Madras and Southern Mahratta Railway to be asked whether they are prepared to work this line, and if so, on what terms, so long as the Kadur-Bangalore Section is worked by them".

7. Chickmagalur is the only District Headquarter not connected by railway. The extension of the railway is likely to give an impetus to the development of an important malnad tract of which Chickmagalur is the principal town. Moreover as the amount to be provided by Government will be about 14 lakhs and the income from the line together with the railway cess will be sufficient to make up more or less the interest on the capital cost contributed by Government, it is necessary to consider favourably the request of people who have shown a genuine desire to bear a substantial portion of the burden of this line.

Bangalore,
24th October 1925.

2 OCT 1925

S.N.

Record of Cases submitted for the Orders of His Highness the Maharaja.

Subject.

Construction of Kadur-Chickmagalur Railway Line.

285

Order.

~~KRW~~

27/10/25

5933

General and Revenue Secretariat

C126

Construction of the Kadur Chickmagalur Railway Line

(*)

31. All urgent or confidential files returned with His Highness' orders may, in the absence of instructions or indications to the contrary, be ordinarily circulated to the Members of Council for perusal after the issue of orders.

33. The Secretaries concerned should see that orders in the cases referred to above are issued at once and that the files are returned immediately after to the Chief Secretary for circulation to the Members.

34. In all other cases, the files will first be circlated to the Members of Council at headquaters and then sent to the Secretariat coneerned for the issue of orders.

Circulated to Members of Council for perusal of His Highness' orders before/after* issue of orders. (*Vide* Rules 31, 33 and 34 of the Subsidiary Rules for the conduct of business of Council in the Manual of Council Rules and Procedure.)

Chief Secretary to Government.

Through the Secretary to Government,

.....Department.

FIRST MEMBER OF COUNCIL. [Seen by the Member.]

SECOND MEMBER OF COUNCIL. Please address Dist Board immediately (Drop the subject)

29/10/25

EXTRA MEMBER OF COUNCIL.

3851 28/10

NOTE - Contn. sheet.

Serial No.

Draft letter to Board

HPK 30/10 — 2nd Reminder RB 30/10

3992/31/10

APD 31/10

Done WD 31/10.

2 L 3248. 2.11.25.

Re D.C. Kadur S.T.

Requests to consult the S.T. Board whether they are willing to pay the Govt the accumulated surplus of the Railway cess to meet part of the cost of construction of the line and continue to levy the cess & make it over to Govt to meet the losses in working the line for a period 25 years.

GENERAL & REVENUE SECRETARIAT - 6 NOV 1925 LOCAL SELF GOVT

D.O 488/Lo dt 26.11.25 from Mr C. Srinivasachar Chikmagalur. Accepts the offer of Govt to construct the Kadur-Chikmagalur Rly line as a Govt Concern, agree to pay the accumulated Rly Cess & levy & pay Rly Cess for 25 years subject to the condition that if the line works at a profit the net earnings together with

Serial No

DEWAN'S OFFICE
REGD. 30. NOV. 1925
Reg. No. 1x050

his accumulated Railway Cess now handed over to Govt. Should be utilised for continuing the line to Mudigere, Balehonnur & Koppa

Members minute on the D.O.

"L. L. Secy. Please submit to Dewan with file L may be included if Dewan approves for consideration in Council. Sd/- K.G. 28/11"

Subd with file

Secy 28/11 K.G. / L. Secy

Dewan.

28/11

28/11

Sd/- 29/11

may be completed for Council. sd

Chief Secy with Comp[ts].

Sd/- 1.12

2/12

To Finl Secy

2/12/26

Sd/- 9.12.26

Cancelled 10/-

69

Note—Contn. Sheet

(For Disposal at a Meeting)

No. C. 126
7 1925-6

GENERAL AND REVENUE SECRETARIAT.

Council Matter.

SUBJECT.
(Clause xii of the schedule)

Construction of the Kadur-Chickmagalur Railway Line.

CIRCULATED TO THE MEMBERS OF COUNCIL.

By Order,

10th December 19 25.

Chief Secretary to Government.

Extraordinary Member of Council.

First Member of Council.

Second Member of Council.

5393
11/12

Extra Member of Council.

Extract from the Proceedings of the 761st *Meeting of the Council of His Highness the Maharâja, held at Bangalore on the* 23rd December 1925. *19*

118. Subject. - Clause xii of the schedule.

Construction of the Kadur-Chickmagalur Railway Line.

OPINION OF THE COUNCIL.

The proposals of the District Board may be accepted with the modification that in case the line gives any surplus profits after meeting interest charges on the capital contributed by Government these may be utilized for further railway development in the distric

(Signed) A. R. Banerji,

Dewan of Mysore.

"EXTRACT"

Chief Secretary to Government.

WD 1471—GPB—2,000—1-3-21

G. R. S. 12]

W D 473—GPB—1,000—12-9-18

General and Revenue Secretariat.

File No. of 191

Subject.

Construction of the Kadur-Chickmagalur Railway line.

Extract from the Proceedings of the Council is put up.

Forwarded, with compliments, to the Financial Secretary to Government, under paragraph 9 * of the Government Order No. G. 17572-8—G. M. 676-17-1, dated 22nd June 1918.

By Order,

Chief Secretary to Government.

*9. (*a*) If the views expressed by the Financial Secretary in any case, whether original or un-officially referred, are not accepted by the Member of Government in charge, or by the Dewan and Members of Council, as the case may be, the file containing the discussions shall be sent to the Financial Secretary a second time, in order to enable him, in cases in which he considers that the orders proposed to be issued are opposed to financial rules of Government or to recognised financial principles or for other reasons of a financial nature, are open to objection, to record a respectful representation to that effect, which will be placed by the Dewan before His Highness the Maharaja for consideration.

(*b*) All cases sent to the Financial Secretary under this rule should be treated as immediate and returned to the Department concerned within three days of receipt.

Submitted to His Highness.

The Kadur District Board, who were asked whether, if the Kadur-Chikmagalur line were started as a Government concern, they would pay to Government the accumulated Railway Cess to meet part of the cost of construction and continue to levy the cess and make it over to Government to meet the losses in working for a period of 25 years, have resolved as follows:--

"The Board accept with thanks the offer of the Government to construct the Kadur-Chikmagalur Railway line as a Government concern. The Board agree to pay the accumulated railway cess and levy and pay railway cess for twenty-five years. Should, however, the apprehensions of the Government prove groundless and the Railway line work at a profit, the net earnings together with the accumulated railway cess now handed over to the Government should be utilised for continuing the line towards Mudegere, Bale-Honnur and Koppa, the Government spending on the undertaking, in addition, as large a sum as the finances of the State permit. In making this proposal, the Board wish respectfully to point out to Government that the Board will have paid in the shape of Railway Cess as much as the full cost of the line in the course of 25 years and that it is but fair that the entire profits of the undertaking should be earmarked for extension of railways in the District itself.

"The root cause of the backwardness and decline of the Malnad is want of proper communications and facilities for transport of produce and goods. The Board trust that the Malnad hinterland railway will prove to be a paying proposition to the Government, in as much as they will not only get a small rate of interest on the investment but also derive substantial sums of money by the sale of lands now lying -

fallow

for want of cultivators by increased land revenue and by exploitation of forests whose produce cannot now be marketed on account of very heavy cost of transport'.

It is not possible to Government to commit themselves at this stage as to the particular directions in which further extensions of the railway line will be undertaken, whether it should be towards Mudegere and Koppa or any other alternative line. There is, however, no objection to our giving a promise that, in case the railway line yields a sufficient return not only to pay the interest on the Government share of the capital but leaves a surplus, this surplus will be made available for further railway extension in the District. As regards the amount contributed from the railway cess towards the capital cost similarly, there would be no objection, in case the line proves so remunerative as to yield a rate of interest equivalent to what Government has to pay on its loans to allow the District Board to get the interest on this amount after the Government's share of the interest is fully paid up and make it available for further railway extension in the District. We may also enter into some arrangement in such a case to make the capital itself now provided by the District Board from the Railway Cess also available. I do not believe that these conditions are likely to be satisfied within the next 25 years but it might encourage the District Board to improve their resources and promote further railway development in the District with such an assurance.

The matter was considered in Council who have resolved as follows:-

"The proposals of the District Board may be accepted with the modification that in case the line gives any surplus profits after meeting interest charges on the capital contributed by Government, these may be utilised for further railway

development

development in the district'.

The Resolution may be graciously approved.

Now that the main items are settled, arrangements will be made to proceed with the project.

Dated, Bangalore,
29th December 1925.

T.M.K.
C&R

STATEMENT OF CASES SUBMITTED FOR THE ORDERS OF HIS HIGHNESS THE MAHARAJA DURING THE TOUR OUTSIDE THE STATE ON ... December 29th, 1925 ...

Serial No.	Subject	Orders of His Highness	Order regarding submission of files (*vide* foot-note)
471	Proposals of the Kadur District Board for the construction of the Kadur-Chikmagalur Railway line.	513. Sanctioned by His Highness 1.1.26	C

4 JAN

NOTE.—The letter a, b or c may kindly be inserted by the Private Secretary to His Highness in the last column to indicate whether
File may be submitted at once ... ...a
File may be submitted after His Highness' return ... ...b
File may not be submitted at all c

General and Revenue Secretariat

C 126

SUBJECT

Construction of the Kadur-Chickmagalur Railway line.

(*)

31. All urgent or confidential files returned with His Highness' orders may, in the absence of instructions or indications to the contrary, be ordinarily circulated to the Members of Council for perusal after the issue of orders.

33. The Secretaries concerned should see that orders in the cases referred to above are issued at once and that the files are returned immediately after to the Chief Secretary for circulation to the Members.

34. In all other cases, the files will first be circlated to the Members of Council at headquaters and then sent to the Secretariat coneerned for the issue of orders.

Circulated to Members of Council for perusal of His Highness' orders before /after issue of orders. (*Vide* Rules 31, 33 and 34 of the Subsidiary Rules for the conduct of business of Council in the Manual of Council Rules and Procedure.)

By Order,

8/11. *Chief Secretary to Government.*

Through the Secretary to Government,

.....Department.

95/5·1 FIRST MEMBER OF COUNCIL.

6032/5/1 SECOND MEMBER OF COUNCIL.

EXTRA MEMBER OF COUNCIL.

NOTE- Contn. sheet.

Secy. K.L., with Compts.

6/11.

6/11.

For the following reasons the authorities to issue purchases from the Rly Admn.

1) The Govt orders the sanction for the construction of a State line ~~[illegible]~~

2) The Govt in view the circumstances of Capital expenditure and the Concurrence of the Finance Dept is necessary

3) Even in the case of State lines constructed in which the Govt bears some share, the orders have issued from the Govt

4) The orders regarding the acquisition of the surplus assets from companies lies with the discretion of the Govt to do so. The immoveable assets

364-2 WD 264—GPB—40,000—17-12 [App. F. III

Serial No.

Subd These papers may perhaps be now transferred to the Rly Secretariat for taking needful action in accordance with the instructions contained in the Subs Note.

Sd 7/1

for orders as to whether orders according to the Resolution has to issue from here or the file transferred to the Railway Secty

8/1.

The Standard may be moved from the L.S.G. Dept as Distt affairs & Municipalities do not come within

7/1

Read with a draft as directed

The Distinct Board is entering into a contract with the Govt whereby the Dist Bd not only undertakes to make over to Govt the accumulated Railway cess and also to continue to levy the cess and make it over to Govt to enable the govt to construct its own railway line in the District Whether the

NOTE—Contn. Sheet

Serial No.

diversion of the accumulated cess to such a purpose including the continuance of the cess for such a purpose is legal under Section 24 (a) of Regln no VI of 1918 has perhaps to be decided before issuing the order. no doubt in the Section referred to it is not expressly stated that the Rly Concessions has to be ~~govt for Dist Bd~~ for the benefit of Dist Bd as per the above view of the matter has perhaps to issue from this Branch

Please bring up
DS
9/11

Draft G.O. as submitted—
DS

~~The G.O.'s under regd to the Bangalore per Rd for Railway (Pl. and the Shimoga Arsikere Rly~~

Hind attention is invited to the opinion of the Council dated 22-10-28. M.S.M Rly Co'y is to be consulted according to para 2 of the Resolution. There is nothing in the file to show that action has been taken as to this. Submd for orders as to whether a G.O. is to be issued from the D.S.'s in accordance with the Resolution of 23.12.28 only or whether the file may be

NOTE—Contn. Sheet

Serial No

Transferred to the Rly Section for action for consulting the M. & S.M. Rly & for issuing the G.O. as was done in the case of Ramanagaram-Kolar & Shimoga-Arsikere Railways H. W. V.

Ch Secy Mysore
Ch Secy)

28/2/26

Please bring it
8/2/26.

Please bring
to-day
8/2/26

Draft Agreement for
approval
Ch Secy) 28/2/26

Draft Returned as
instructed & revised
28/2/26
Ch Secy)

11/2/26

Draft Agreement 12/2/26

Papers & the Draft
10a
15/2/26
Draft as given
8
Draft 15/2/26
for Rly Branch as revised
Ch Secy) 16/2/26

Note—Contn. Sheet

WD 0569—GPB—40,000—31-7-25

(File No. of 192

General and Revenue Secretariat

Serial No.

NOTE—Contn. Shee

General and Revenue Secretariat | L/P File No. 113 of 1924

Serial No 4

To, The President, Dist. Bd. Kadur, the Deputy Commr, Kadur, the Comptroller & the Chief Engineer for Railways

No L 5728-31/L 20-2-1926.

Sanctions the Construction of the Kadur-Chickmagalur Railway as a Govt. line on the terms agreed upon by the Kadur Dist. Bd.

NOTE—Contn. Sheet

38625

D.C.4.]

No. 4882B Enc. two. 24-25

OFFICE OF THE DEPUTY COMMISSIONER,
KADUR DISTRICT.

Dated Chikmagalur, 16th March *1925.*

GENL. & REV. SECTT. ENG. C 18 MAR 1925 G. D. SECTION.

G.B.Heblikar, Esq., B.A., LL.B.,
Deputy Commissioner, **and President, District Board,**
Kadur District.

GENERAL & REVENUE SECTT. 5933 19. MAR. 1925

To

B. Nagappa, Esq., Bar-at-Law,
Secretary to the Government
of His Highness the Maharaja of Mysore,
Local and Legislative Departments,
Bangalore.

Leg 113-24-1

SIR,

I have the honor to forward herewith a resolution of the Kadur District Board in the matter of the construction of a Railway line from Kadur to Chikmagalur.

2. This project has been engaging the attention of the Government and the District Board for at least quarter of a century. But -- owing to the straightened financial condition of the District Board til they resolved to levy a Railway Cess and the world-wide War, which very materially enhanced the cost of construction of the Railway line and crippled the resources of the State, the scheme has not fructified with the result that Chikmagalur is now the only District Head Quarter in the State without a Railway communication.

3. With a view to encourage the construction of Railways in the State, Government having offered in their Mm. Order No. Fl.4392-81/G.F. 163-13-1 dated the 22nd April 1914, certain concessions to Local Bodies in the matter of constructing Feeder Railways, the District Board --- moved the Government to sanction and the Government sanctioned the levy of a Railway Cess in this District at 6 pies in the Rupee for the --- purpose of meeting the interest charges on the debenture Loan to be - raised by them for the purpose of linking Chikmagalur with Kadur by --

Rail...

Railway. This cess is being collected since the year 1916-17. The realizations under this head at the credit of the District Board in the Government Savings Bank with accumulated interest thereon up to end of December 1924 amounted to Rs. 3,84,614/- and will amount to -- Rs. 5,10,000/- at the close of the next official year.

4. The latest estimates prepared in 1921 put down the length of the line at 28.2 miles and the cost at Rs. 29,09,958/- for metre guage line.

5. As at the last (October) Session of the Representative -- Assembly, Government were pleased to state, in response to the Representation from this District that if the District Board would send up a scheme, it would be favourably considered and interest gauranteed on the loan to be floated for the purpose, the District Board took up the question and referred the matter to a select Sub Committee - consisting of the marginally noted persons for submitting practical proposals. The Sub Committee --- which met on the 14th January 1925 and subsequent days examined the - whole subject carefully and expres -sed the opinion that in view of the recent drop in prices of iron - and other materials and wages it would be possible, by the substitution of light rail (41½ lbs) for heavier ones and practising econo--mies in other directions, to reduce the cost by 5 lakhs (that is from 29 to about 24 lakhs) and that the District Board would be in a position to finance the scheme if the grant of a moiety of the cost is --- secured from Government. (vide copy of their resolution hereto -- appended)

1. The President, Kadur District Board,
2. The Vice-President, do
3. The Executive Engineer, Kadur Division,
4. Mr. T.B. Mallegowda,
5. " S. Honnappiah.

6. The question was then discussed by the District Board at their meeting held on the 5th February 1925, when they unanimously accepted the recommendations of the Sub Committee and resolved that Government be approached with a request that they be graciously -- pleased to grant to the Board a moiety of the cost of the scheme. - the other half (viz:- 12 lakhs) being met by the Board as under:

under:-

i. A sum of Rs. 5,10,000/- from the Railway Cess collections at the end of June 1926:

ii. By raising a Debenture Loan (repayable in 10 to 30 years) of 7 lakhs at 7% interest per annum.

7. The Board propose to set apart the entire net earnings of the line estimated at Rs. 26,000/- a year for the formation of a Sinking -- Fund to liquidate the loan as early as practicable, and to pay interes amounting to Rs. 49,000/- annually to the Debenture holders from the -- proceeds of the Railway Cess, the interest on the loan being the first charge on the Railway Cess collections.

8. The District Board are ever grateful to the benign Government for their sincere attempts to ameliorate the condition of the people and thereby check the ever increasing poverty and depopulation of this backward Malnad tract. The poverty and depopulation are acting and -- reacting on each other in such a way that there is no getting out of the vicious circle unless and until the whole tract is opened up by -- means of a net work of roads and Railways and a steady influx of agri- -culturists and labourers assured thereby and unless amenities of life and a market for the local produce and home industries, (which have now no commercial value) provided by means of easy and cheap communi- cations. The District Board are merely voicing the sentiments of the people when they urge that the Railway scheme in question is only the first step towards the opening out of the District and that the line should be taken to Mudigere and then on to Narasimharajapura via --- Balehonnur and Koppa and that there is no possibility of amelioration of the condition of the people of the Malnad Taluks of this District - until this loop line is constructed and the nook-shotten places, which are now considered to lie at the back of beyond, linked by means of roads to the line.

9. The Board are steadily increasing the road mileage in the District and thus opening out inaccessible places. The people cannot however, reap the full benefit of the roads unless they are con- nected with the outside world by means of Railways. The cost of -- transport is bound to be out of all proportions to the value of the goods sought to be exported unless the bulk of the distance is ---

covered

covered by Railways. And as their finances stand at present, the Board are not in a position to construct the line without substantial help from Government. Hence this appeal to the benign Government for funds.

10. The Board trust that the Government will not view this scheme from an investor's stand-point, but regard it as a contribution justly due to a large number of His Highness' loyal subjects, who are labouring under such great natural and climatic disadvantages and are doomed to perpetual poverty and gradual extinction - if left to fight their own battle unaided.

11. In these circumstances, the Board venture to express the hope that their proposals will meet with sympathetic consideration at the hands of Government, and that the Government will be --- graciously pleased to grant to them a moiety of the cost of the Railway project from the State Funds.

12. I accordingly request you to move the Government to --- accord sanction to the proposals of the District Board and in view of the exceptional circumstances set forth above, order further - necessary action being taken in the matter so that the work may be put in hand early. On receipt of sanction to the above proposals, drafts of prospectus to be issued for the raising of Debentures -- etc., will be submitted for the approval of Government.

I have the honor to be,

Sir,

Your most obedient servant,

G B Hebbikar

PRESIDENT,
Kadur District Board.

K.L.N.

Extract from the meeting Proceedings of the Kadur District Board convened on the 5th February 1925.

****

Subject No. 22.

Read:- The resolution of the Sub Committee in the matter of financing the Kadur - Chickmagalur Railway. (2) Read Letter dated 5-2-1925 from Mr. C. Vasudeva Rao, Coffee Planter, Chickmagalur suggesting the construction of the Narrow Guage Railway.

Resolution.

Resolved that the report of the Sub Committee be accepted and the Government moved to direct the construction of the Kadur - Chickmagalur line, the Government graciously making a grant to the District Board of half the cost of the line the remaining half being found by the District Board.

Sd/- G.B. Heblikar,
President, District Board,
Kadur District.

" C O P Y "

G B Heblikar

President,
Kadur District Board.

Resolution of the Sub Committee meeting of the Kadur District Board convened on the 14th January 1925 in connection with the construction of the Kadur-Chickmagalur Railway.

****

The cost of the construction of a metregauge line from Kadur to Chickmagalur according to the estimate prepared in 1921 is Rs. 29,09,950/-. The Sub Committee believe that in view of th drop in prices of iron, timber and other materials and the substitution of 50 and 60 Lbs rails by 41½ Lbs throughout it is possible to reduce the cost very substantially.

2. The Sub Committee are of opinion that it is possible to reduce the cost of the scheme to 24 lakhs and that the District Board of Kadur will be in a position to finance it only if they secure from the Government a grant of a moiety of the cost of the construction. Even then, the District Board will have to borrow 7 lakhs of rupees at a rate of interest not exceeding 7% per annum as they will have, by the end of June 1926, at their credit, a sum of Rs. 5,10,000/- being the proceeds of the Railway Cess imposed in 1916-17 together with the accumulated interest thereon.

3. At the end of June 1925, the amount at the credit of the Board will be Rs. 4,42,762/- and the amount available for being handed over to Government for the construction of the line on 30th June 1926 will be Rs. 5,10,000/-.

4. The Board will have thus by raising a loan of 7 lakhs, provided for the scheme a sum of Rs. 12 lakhs being their quota of the cost of the scheme.

5. The Board will have to pay all the proceeds from the Railway Cess towards interest on the loan if the rate of

interest

interest is 7%.

6. The net earnings of the Kadur - Chickmagalur line are computed at the least at Rs. 26,000/- and odd. A sum not exceeding Rs. 20,000/- may be set apart every year towards the sinking fund. This will enable the Board to liquidate the entire loan in fourteen years. As the loan of 7 lakhs can be wiped out in 30 years if a sum of Rs. 7574 (interest being calculated at 6½%) is paid towards the sinking fund the loan may be declared to be repayable in ten to 30 years.

Sd/- G.B. Heblikar,

Chairman.

For President.

Kadur District Board.

LB 113-24-2

To

The Deputy Commissioner,
Kadur District, Chickmagalur.

No. L 3248
Dated Bangalore; 2/11/ 1925

Sir,

With reference to correspondence ending with your letter No. 488.L.B/24-25, - dated the 27th 30 September 1925 in the matter of the construction of a Railway Line from Kadur to Chickmaglur, I am directed - to state that the total cost of the line - inclusive of the rolling stock is estimated at Rs. 22,15,173 and without it - - - Rs. 18,69,332 for a metre gauge line. Excluding the sum of about Rs. 5 lakhs which the Board have at credit from the accumulated Railway Cess earnings, another 14 -- lakhs of rupees would be required to meet the ~~balance~~ Cost of the line without the rolling stock. It is considered that it - - would be more economical to transfer the - working of the line after construction to the Madras and Southern Mahratta Railway - Co., Ltd., so long as they continue to --- work the Railway line from Hauhar to Bangalore so as to avoid the pur- -- chase of rolling stock and thus to effect a reduction in the capital cost by about - 4 lakhs. In these circumstances I am to request you to be so good as to consult -- the District Board whether they are willing to pay the Government the accumulated surplus of the Railway Cess to meet part of the cost of construction of the line -

and continue to levy the Cess and make - it over to Government to meet the losses in working the line for a period of 25 - years. I am to add that the line will be constructed as a Government line.

I have etc.,

L & L. Secy., to Government.

E.W.M.

No. 4886 RE... 36481 ...

28 NOV 1925

OFFICE OF THE PRESIDENT,
KADUR DISTRICT BOARD,

Dated, Chickmagalur 26th Nov. 1925.

Sir,

I am directed to submit herewith for your information a copy of the Resolution passed by the Kadur District Board at their meeting held on the 24th instant in regard to the conditions proposed by the Government in their letter No. L. 3248/L.B. 113-24-2 dated 2-11-1925 for the construction of the Railway Line from Kadur to Chickmagalur.

4946/28/11

Yours sincerely,

Srinivas Rao

KB.

To,

K. Chandy, Esquire, B.A.,

First Member of Council,

Bangalore.

Extract from the Second meeting of the Kadur District Board convened on the 24th November 1925.

****

D. O. X X X

Subject No. 19.

Read:- Letter No. L. 3248/L. 3. 113-24-2 dated 2nd November 1925 from the Secretary to Government, - Local and Legislative Departments enquiring whether the District Board are willing to pay the Government, the accumulated - Railway Cess to meet a portion of the cost of construction of Kadur-Chickmagalur Railway Line and agree to continue to levy the Cess for a period of 25 years and make it over to Government to meet the losses in working the line and stating further that the Railway Line will be constructed as a Government Line.

Resolution:--

The Board accept with thanks the offer of the Government to construct the Kadur-Chickmagalur Railway Line as a Government concern. The Board agree to pay the accumulated railway cess and levy and pay railway cess for - for twentyfive years. Should however the apprehensions of Government prove groundless and the Railway Line work at a profit, the net earnings together with the accumulated railway cess now handed over to the Government should be utilised for continuing the line towards Sudigere, Balehonnur and Koppa- the Government spending on the undertaking, in addition as large a sum as the finances of the State permit. In making this proposal the Board wish respectfully to point out to Government that the Board will have paid in the shape of Railway Cess as much as the full cost of the line in the course of 25 years and that it is but fair that the entire profits of the undertaking should be earmarked for extension of Railways in the District itself.

The root cause of the backwardness and -

and decline of the malnad is want of proper communications and facilities for transport of produce and goods. The Board - trust that the malnad Hinterland Railway will prove to be a paying propocition to the Government in as much as they will not only get a small rate of interest on the investment but also derive substantial sums of money by the sale of lands now lying follow for want of cultivators by increased land - revenue and by exploitation of forests whose produce cannot now be marketted on account of very heavy cost of transport.

****

X X X

Sd/- G. B. Heblikar,

President,

Kadur District Board.

" C O P Y "

President,

N.R. Kadur District Board.

No. L.B. 488 — 22279
22-25
E. one

OFFICE OF THE PRESIDENT,
Kadur District Board.

Dated, Chickmagalur 27-11-1925. 192
28

From

G. B. Heblikar, Esquire, B.A., LL.B.,

President, District Board,
Kadur District,
CHICKMAGALUR.

GENL. & REV. SECTT. Br. 29. NOV. 1925 To G. D. SECTION.

GENERAL & REVENUE SECRETARIAT. 30 NOV 1925 LOCAL SELF GOVT. BRANCH

B. Nagappa, Esquire, Bar-at-law.,

Secretary to Government,
Local and Legislative Departments,
BANGALORE.

Sir,

With reference to your letter No. L. 3248/L.B. 113-24-2 dated the 2nd instant enquiring whether the District Board are willing to pay the Government accumulated Railway Cess to meet part of the cost of construction of the Railway Line from Kadur to Chickmagalur and agree to continue to levy the Cess for a period of 25 years and make it over to Government to meet the - losses in working the line and stating further that the Railway Line will be constructed as a Government Line, I have the honour to -forward herewith a copy of the resolution passed by the District Board at their meeting held on the 24th instant in the matter.

I have the honour to be,

Sir,

Your most obedient servant,

For President,
Kadur District Board.

N.R.
onon. the previous papers on
the subject have been
subd to the Govt with D 3648 -
on 30/11/25. may this be subd
in Court - Put up with Connected file
which is being sent to the Hon'ble Minister (Revenue)

30/11

Secy to Govt
Rev Dept
It was reported to the Hon'ble Min for Rev Secy that the main file is before the Hon'ble Secy that there is nothing in this letter which is not already in the file. Reference will be placed in that after the file is received

Extract from the Second meeting of the Kadur District Board convened on the 24th November 1925.

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X X X

Subject No. 19.

Read:- Letter No. L. 3248/L.B. 113-24-2 dated 2nd November 1925 from the Secretary to Government, - Local and Legislative Departments enquiring whether the District Board are willing to pay the Government, the accumulated - Railway Cess to meet a portion of the cost of construction of Kadur-Chickmagalur Railway Line and agree to continue to levy the Cess for a period of 25 years and make it over to Government to meet the losses in working the line and stating further that the Railway Line will be constructed as a Government Line.

Resolution:--

The Board accept with thanks the offer of the Government to construct the Kadur-Chickmagalur Railway Line as a Government concern. The Board agree to pay the accumulated railway cess and levy and pay railway cess ~~@2@~~ - for twentyfive years. Should however the apprehensions of Government prove groundless and the Railway Line work at a profit, the net earnings together with the accumulated railway cess now handed over to the Government should be utilised for continuing the line towards Mudigere, Balehonnur and Koppa- the Government spending on the undertaking, in addition as large a sum as the finances of the State permit. In ~~working~~ making this proposal ~~will~~ the Board wish, respectfully, to point out to Government that the Board will have paid in the shape of Railway Cess as much as the full cost of the line in the course of 25 years and that it is but fair that the entire profits of the undertaking should be earmarked for extension of Railways in the District itself.

The root cause of the backwardness and -

and decline of the malnad is want of proper communications and facilities for transport of produce and goods. The Board - trust that the malnad Hinterland Railway will prove to be a paying proposition to the Government in as much as they will not only get a small rate of interest on the investment but also derive substantial sums of money by the sale of lands now lying follow for want of cultivators by increased land - revenue and by exploitation of forests whose produce cannot now be marketted on account of very heavy cost of transport.

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X X X

Sd/- G. B. Heblikar,
President,
Kadur District Board.

" C O P Y "

President,

N.R. Ms. Kadur District Board.

L.5728-31. F.Do 126

Ls 113-au-4

PROCEEDINGS OF THE GOVERNMENT OF HIS EXALTED HIGHNESS THE MAHARAJA OF MYSORE.

- - - - - - - - -

R e a d:-

Letter No.488/L.B.24-25, dated the 16th March 1925 from the Deputy Commissioner and President, District Board, Kadur District, forwarding copy of the resolution of the District Board passed at their meeting held on the 5th February 1925 ~~resolving~~ to the effect that Government may be moved to direct the construction of the Kadur-Chickmagalur Railway line, the Government making a grant to the District Board of half the cost of the line, the remaining half being found by the District Board and stating that the Sub-Committee of the District Board who went into the question fully ~~have opined~~ is of opinion that the cost of the line which was estimated at Rs.29,09,958 for a metre guage line of 28.2 miles may be reduced by Rs.5/- lakhs owing to the fall in the price of iron and other materials, by substituting ~~lighter~~ rail and by practising economy in other directions.

Correspondence ending with letter No.488/L.B. 24-25 dated 26th November 1925 from the President, District Board Kadur District, forwarding copy of the resolution of the Board passed at their meeting held on 24-11-1925 accepting the offer of the Government to construct the Kadur-Chickmagalur Railway Line as a Government concern and agreeing to pay the accumulated Railway Cess ~~for twenty years and to pay Railway Cess~~ and to levy and pay Railway Cess for twenty

five years and requesting that if the line prove a profitable one, the net earnings together with the accumulated Railway Cess now handed over to the Government should be utilised for continuing the line towards Mudigere, Bale-Honnur and Koppa, the Government spending on the undertaking as much additional sum as the finances of the State permit.

Order No.

Dated, Bangalore the February 26:

The question of the construction of a Railway line from Kadur to Chickmagalur has been urged on the attention of the Government for the past 25 years. With a view to enable a fund being built up to meet the cost of this line, the District Board have been levying a railway cess of 6 pies in the rupee since the year 1916-17. The realisations by means of the Railway Cess at the credit of the District Board with the accumulated interest thereon at the end of June 1924 was Rs.3,84,614 and the amount is expected to be Rs.5,10,000 by the end of June 1926. The District Board have offered to allow the accumulated balance of the Railway Cess Fund at their credit, to be utilised towards the construction of the line and provide the balance up to a limit of half the expenditure by raising a debenture loan, the other half of the cost being given as a grant by Government. The Secretary to Government in the Railway Department who was consulted in the matter has stated that the total cost of the line inclusive of the rolling stock would be Rs.22,15,173/- and without the rolling stock,

Rs.18,39,332 for a metre gauge line. The line is expected to yield a net revenue of about Rs.20,000 and the annual realisations from the Railway Cess amounts to Rs.56,000 and both these sums come approximately to about Rs.75,000. As the District Board have already about Rs.5 lakhs at their credit, another Rs.14 lakhs will be required to meet the balance of the cost of the line without the rolling stock.

The Railway Secretary is ~~further~~ of opinion that it will be more economical to transfer the workings of the line after construction, to the Madras and Southern Mahratta Railway, who charge a hire of 5 per cent on the gross receipts of rolling stock, so long as they continue to work the Kadur-Bangalore line, as in that case it would be unnecessary to ~~levy~~ buy additional rolling stock and in this way the capital cost will be reduced by nearly Rs.4 lakhs.

There is at present no uniformity as to the conditions on which the District Boards are allowed to take part in the construction of railway lines in the State. The Government of India having recently abolished the system of having separate branch lines constructed by independent local agencies, Government proposed to the District Board ~~to~~ they would construct the Railway as a Government line, on condition that the Board agreed to pay the Government the accumulated surplus of the Railway Cess to meet part of the cost of construction and to continue to levy the cess and make it over to Government to meet the losses in working, for a period of 25 years. The District Board accepted the offer of

Government with the proposal that should the railway work at a profit, the net earnings together with the accumulated Railway Cess now handed over to Government should be utilised for ~~xxxxx~~ continuing the line towards Mudigere, Balehonnur and Koppa. It is not possible for Government to commit themselves at this stage as to the particular directions in which further extensions of Railway lines will be undertaken. Government are however pleased to direct that the proposal of the District Board may be accepted with the modification that in case the line gives any surplus profits after meeting interest charges on the capital contributed by Government, these may be utilised for further railway Development in the District.

The District Board should make suitable arrangements to place the railway cess fund at the credit of the Railway Department ~~for taking steps to proceed with the project~~.

The Chief Engineer for Railways is requested to take suitable action to submit proposals to Government to give effect to the project.

Secretary to Government,
Local and Legislative Departments.

To

The President, District Board, Kadur District.
The Deputy Commissioner Do.
The Comptroller to Government.
The Chief Engineer for Rwailways.
Copy to Secretary to Government for railways with estimate.

Government of His Highness the Maharaja of Mysore

GENERAL AND REVENUE DEPARTMENTS.

G. O. No. L. 5728-31—L. B. 113-24-4, dated 20th February 1926.

The Kadur-Chikmagalur Railway.

Sanctions the construction of —— as a Government line on the terms agreed upon with the Kadur District Board.

READ—

Letter No. 488—L. B. 24-25, dated the 16th March 1925, from the Deputy Commissioner and President, District Board, Kadur District, forwarding copy of the resolution of the District Board, passed at their meeting held on the 5th February 1925, to the effect that Government may be moved to direct the construction of the Kadur-Chikmagalur Railway Line, the Government making a grant to the District Board of half the cost of the line, the remaining half being found by the District Board and stating that the Sub Committee of the District Board who went into the question fully is of opinion that the cost of the line which was estimated at Rs. 29,09,958 for a metre gauge line of 28·2 miles may be reduced by Rs. 5 lakhs owing to the fall in the price of iron and other materials, by substituting lighter rails and by practising economy in other directions.

Correspondence ending with letter No. 488—L. B. 24-25, dated 26th November 1925, from the President, District Board, Kadur District, forwarding copy of the resolution of the Board passed at their meeting held on 24th November 1925, accepting the offer of the Government to construct the Kadur-Chikmagalur Railway Line as a Government concern and agreeing to pay the accumulated Railway Cess and to levy and pay Railway Cess for 25 years and requesting that, if the line proves a profitable one, the net earnings together with the accumulated Railway Cess now handed over to the Government, should be utilised for continuing the line towards Mudgere, Bale-Honnur and Koppa, the Government aspending on the undertaking as much additional sum as the finances of the State permit.

ORDER NO. L. 5728-31—L. B. 113-24-4, DATED 20TH FEBRUARY 1926.

The question of the construction of a Railway line from Kadur to Chikmagalur has been urged on the attention of the Government for the past 25 years. With a view to enable a fund being built up to meet the cost of this line, the District Board have been levying a Railway Cess of 6 pies in the rupee since the year 1916-17. The realisations by means of the Railway Cess at the credit of the District Board with the accumulated interest thereon at the end of June 1924, was Rs. 3,84,614 and the amount is expected to be Rs. 5,10,000 by the end of June 1926. The District Board have offered to allow the accumulated balance of the Railway Cess Fund at their credit to be utilised towards the construction of the line and provide the balance upto a limit of half the expenditure by raising a debenture loan, the other half of the cost being given as a grant by Government. The Secretary to Government, in the Railway Department who was consulted in the matter states that the total cost of the line inclusive of the rolling stock would be Rs. 22,15,173 and without the rolling stock Rs. 18,69,332 for a metre gauge line. The line is expected to yield a net revenue of about Rs. 20,000 and the annual realisations from the Railway Cess amounts to Rs. 56,000 and both these sums come approximately to about Rs. 75,000. As the District Board have already about Rs. 5 lakhs at their credit, another Rs. 14 lakhs will be required to meet the balance of the cost of the line without the rolling stock.

No. L. 5728-31—L. B. 113-24-4, DATED 20TH FEBRUARY 1926.

The Railway Secretary is of opinion that it will be more economical to transfer the working of the line after construction to the Madras and Southern Mahratta Railway, who charge a hire of 5 per cent on the gross receipts of rolling stock so long as they continue to work the Kadur-Bangalore Line, as in that case it would be unnecessary to buy additional rolling stock and in this way the capital cost will be reduced by nearly Rs. 4 lakhs.

There is at present no uniformity as to the conditions on which the District Boards are allowed to take part in the construction of railway lines in the State. The Government of India having recently abolished the system of having separate branch lines constructed by independent local agencies, Government proposed to the District Board that they would construct the Railway as a Government line, on condition that the Board agreed to pay the Government the accumulated surplus of the Railway Cess to meet part of the cost of construction and to continue to levy the cess and make it over to Government to meet the losses in working, for a period of 25 years. The District Board accepted the offer of Government with the proposal that should the railway work at a profit, the net earnings together with the accumulated railway Cess now handed over to Government should be utilised for continuing the line towards Mudgere, Bale-Honnur and Koppa. It is not possible for Government to commit themselves at this stage as to the particular directions in which further extensions of railway lines will be undertaken. Government are however, pleased to direct that the proposal of the District Board may be accepted with the modification that in case the line gives any surplus profit after meeting interest charges on the capital contributed by Government these may be utilised for further railway development in the District.

The District Board should make suitable arrangements to place the Railway Cess Fund at the credit of the Railway Department as soon as arrangements are made for commencement of construction.

The Railway Agent is requested to submit a complete project with detailed estimate at an early date for the sanction of Government.

B. NAGAPPA,
Secretary to Government,
Local and Legislative Departments.

To—The President, District Board, Kadur District
The Deputy Commissioner, Kadur District.
The Comptroller to Government.
The Chief Engineer for Railways.

Fxd.—K.

W D 1814 GPB—480—3-3-26

No. 2131-F.

GOVERNMENT OF INDIA.

RAILWAY DEPARTMENT.

(RAILWAY BOARD).

Dated Delhi, the 19th February 1925.

RESOLUTION.

Financing of Branch Lines.

The Governor General in Council, with the sanction of His Majesty's Secretary of State for India, is pleased to issue the following orders on the subject of Financing of Branch Lines, in supersession of all previous orders on the subject.

1. Branch and Feeder Lines are constructed under an agreement by which the State guarantees a minimum return on the capital, or alternatively, undertakes that the line shall receive, out of the earnings of the main line from traffic contributed by the branch, such a sum, known as a rebate, as will make up the total earnings of the branch to a given sum, while the branch in each case shares with the main line any profits exceeding the guaranteed minimum.

2. This method of encouraging the construction of lines originated 30 years ago simply because the Government of India was unable to furnish the necessary capital.

3. The Acworth Committee pointed out that this method, while enabling lines to be built which would otherwise not have been built, has no other merit. The financial terms usual before the war are now quite inadequate and if the system is to continue they will have to be revised. All the witnesses before the Committee who asked for a revision of the terms admitted that, if the main line were in a position to build a given branch itself, they would prefer that it should be done by the main line rather than that it should be done as a separate undertaking.

4. Amongst the disadvantages pointed out by the Committee are the following :—

(*i*) The Branch Line Company is usually a fifth wheel to the coach. It implies in some cases a separate construction staff; it always implies a separate Board of Directors, and separate accounts.

(*ii*) Where the branch is worked by the main line, if its Directors feel that the management is unsatisfactory, they not only make representations to the main line administration, but in the last resort can appeal to the Railway Board which does not make for harmony.

(*iii*) Capital raised by a small private undertaking, even with a Government guarantee, will cost more than money raised by the State.

(*iv*) Inconceivable confusion results from the multiplication of independent Railway Companies—each company, small or great, desires to reserve for itself a separate sphere of influence; and jealously demands that, if any new comer intrudes into that sphere, he shall pay toll to the original concessionaire. This only complicates a situation which ought to be considered solely from the point of view of the public interest.

New proposals for the extension or connection of lines by small independent companies are either refused owing to protests by the old company or only permitted on a basis of elaborate accounting between the new company and the old for the profits which hypothetically would have belonged to the old line had the new line not been opened.

5. The only arguments urged in favour of the Branch Line Companies were :—

(*i*) That money had been raised which the Government of India was unable to furnish.

(*ii*) That a claim was made that the Branch Line Company obtained from local sources money that would never be subscribed to a Government loan.

(*iii*) That there may be cases of a Branch Line of smaller gauge *worked independently*, which the Branch Line Company can operate more economically than a main line.

6. The Acworth Committee, therefore, so far from approving of this system considered that the aim of the Government should be to reduce by amalgamation the number of existing companies and that it should only be in cases where the State cannot or will not provide adequate funds that private enterprise in this direction should be encouraged.

7. The disadvantages pointed out by the Acworth Committee require to be even further amplified. The existing Branch Line Companies have ceased for some time to raise additional capital for capital requirements. They have either obtained overdrafts from various Banks for this purpose at heavy rates of interest or issued debentures at special rates of interest (usually about 7 per cent.) or in several cases asked for money to be advanced to them by the Railway Board. So far, therefore, from reducing the amount that the Government of India have to raise in the open market, they are at present increasing that amount.

8. Another serious disadvantage which is not mentioned by the Acworth Committee is that the main line usually works the Feeder or Branch Line for a remuneration which, in most cases, is limited to a maximum of a fixed percentage of the gross earnings of the Branch Line (usually 40 per cent. or 50 per cent.)—terms of remuneration which at present are grossly inadequate. The result of this arrangement is that many of the main lines whose working expenses are from 60 to 80 per cent. of the gross earnings are saddled with heavy expenditure which ought to have been debited to Branch Line Companies. Where the Branch Line Companies are "successful," that is, where the shares stand at a high figure, their profits are inflated owing to their working expenses being thus artificially reduced. Again, where in the case of less "prosperous" Branch Line Companies the Government has to make a direct subsidy in order to make up the guaranteed interest on the capital, the amount paid by way of subsidy does not reveal the true loss of the Government in connection with the Branch Line Company. To this subsidy should be added also the additional loss incurred from the main line working the Branch Line at less than the actual cost. Even this, however, does not give a complete statement of the loss sustained by Government in connection with these Companies. These Companies have been supplied with land free of charge and the cost of such land is not taken into account either in the Capital or the Revenue Accounts of the Companies concerned.

9. The only real argument in favour of these Companies is that they must be utilised in cases where the Government itself is unable or declines to raise the necessary amount of capital for new constructions. It is doubtful whether such a position is likely to recur in the future. It is admitted that to use the agency of these Companies is a far more expensive method of raising money for the construction of railways than direct Government loans can ever be. The amount of assistance given by Branch Line Companies in the past has been trivial; the total amount of capital raised

through the agency of Branch Line Companies has only been about Rs. 10¾ crores– an amount which in itself is less than the lapse that occurred last year in the provision for capital expenditure in the Railway Budget.

10. The difficulties and complications now experienced in connection with these Branch Line Companies are out of all proportion to the insignificant financial facilities offered by the Companies. The Government of India have therefore decided that the Branch line policy should be abandoned and that an endeavour should be made to reduce the number of the existing Branch Line Companies. If on any occasion the Government of India should be unable to find funds for construction (which is not the case at present), and should it be considered advisable to tap fresh sources for subscription to railway loans by offering terms different from those given to the ordinary Government loans, that is, by offering not only a fixed rate of interest but a share in the profits of a particular Branch Line, there appears to be no particular advantage of using a financial half-way house specially to float a loan on such terms; there appears to be no reason why the Government should not float the loan direct. But it will probably be found sufficient to raise short term debentures at a high rate of interest—to be liquidated when the loan market is favourable—a procedure adopted now by the Branch Line Companies, but at a higher rate of interest than would be necessary for the Government.

11. There remains the case of the District Board Railways for which some of the capital or the security for the capital is secured by a special cess levied by the District Board throughout the district.

The Acworth Committee pointed out that where a District Board was the promoter of a new Branch Line, considerations other than purely commercial came into play with the result of further complications and confusion. In a footnote to the report they referred to the views expressed by the Madras Government who had drawn attention to a case in which, although no short-circuiting was involved, there had been a delay of over 10 years in arriving at a decision in regard to the terms for working a District Board Railway by the South Indian Railway Company. The amount of capital raised by District Boards for such lines has been only Rs. 137 lakhs while the amount raised by Company lines subsidised by District Boards amounts to Rs. 2¼ crores. These amounts are insignificant as compared with the total capital raised by the Government and it is clear that the relief afforded to the Government of India in raising the loans is quite disproportionate to the great complications which have resulted in the working of the railway administration. Loans raised direct by the District Boards do not relieve the market of the Government of India; the money is ultimately borrowed from the Government of India.

12. The legal position regarding the powers of District and Local Boards in the matter of railway construction and management depends in part on the Indian Railways Act, 1890, which, in the absence of express exclusion of its application, extends to all District Board railways and, in part, on the nature of the provision made in the matter in the District or Local Boards Act of the province concerned. It is only in the Madras Presidency that the question has assumed prominence and it will suffice to indicate briefly the nature of the provisions contained in the Madras Local Boards Act, 1920. Action under section 113 of that Act can only be taken "with the previous sanction of the Government of India". Having obtained such sanction, a District Board may either itself construct and maintain a railway within, or partly within, the local area under the control of the Board, or may subscribe to any debenture loan raised by the Government of India or by any other local authority or by any company for the construction or maintenance of any railway which the Board considers likely to be of benefit to the district, or may guarantee the payment from the district fund of such sums as it shall think fit as interest on capital expended on any such railway (that is, whether the railway is constructed by the Government of India or by any other local authority or by a Company).

Section 236 of the same Act provides that the accumulations of a local railway cess may be utilised for all or any of the purposes specified in section 113, including the guaranteeing of payment of interest on capital spent on a railway.

A District Board in Madras, therefore, can guarantee the payment from the district fund of the money sufficient to make up the minimum interest on capital expended on a railway within its area whether such railway is constructed by the Government of India or by a Company, the only disadvantage attaching to this particular form of guarantee being that the Act does not make the payment of the guaranteed interest a first charge on the District Board Fund.

13. The Government of India could not reasonably use their powers under the Indian Railways Act, 1890, or under, *e.g.*, section 113 of the Madras Local Boards Act, 1920, to prevent a District Board or a local body from constructing a light railway or a tramway which had no physical connection with any existing main line and which that local body proposed to work itself or through a local company. But as things stand at present there is no reason for continuing the practice under which District Boards are allowed to make money out of Branch Lines connected with a main line when they themselves cannot make any arrangements for the working of the lines and require to have them run by the main lines.

14. These District Board railways must not be confused with the light and feeder railways which constitute a provincial subject under the Devolution Rules. The provincial subject in question comprises "light and feeder railways and extra-municipal tramways in so far as provision for their construction and management is made by provincial legislation." That is to say, it comprises only individual light or feeder railways or extra-municipal tramways for the construction and management of which specific provision has been made by an Act of the local legislature of the province concerned. Hitherto, no such legislation has been enacted with the result that the entry in question in the provincial schedule, as also the qualifying words in entry 5(*a*)* in the central schedule, have no operation, and all existing railways of every description are included in the central subject defined in the last-named entry. It should also be observed that the provincial subject in question is "subject to legislation by the Indian Legislature in the case of any such railway or tramway which is in physical connection with a main line or is built on the same gauge as an adjacent line," the effect being that a provincial bill designed to provide for the construction of a light or feeder railway or extra-municipal tramway in physical connection with a main line or built on the same gauge as an adjacent main line would require the previous sanction of the Governor General under clause (*f*) of sub-section (3) of section 80 A of the Government of India Act; and it may be presumed that few occasions are likely to arise in which provision will be made by local legislation for the construction of a light or feeder railway not answering one or other of these descriptions.

* "Railways and extra-municipal tramways, in so far as they are not classified as provincial subjects under entry 6 (*d*) of Part II of this schedule."

15. The proposals set forth in this Resolution are not designed to evade the legitimate operation of the legal position described, in the case of District Board railways, in paragraph 12 and in the case of provincial light and feeder railways, in paragraph 14; but it follows from the proposals that Local Governments and District or Local Boards should not, in the absence of special circumstances, be encouraged to build branch or feeder lines. In other words, the normal procedure will be the construction by the Government of India, or, at its cost, by a Company, of a branch line which a District Board or Local Government desires to have constructed and is prepared to guarantee. But, should the railway programme not permit the construction of such a line within a reasonable time, the possibility of permitting a District Board or Local Government to construct it from its own funds would require consideration.

Unremunerative Lines.

16. The above proposals relate to the procedure adopted in the past and the procedure which it is proposed to adopt in the future for the financing of the construction of branch or feeder lines expected to prove remunerative from the point of view of railway earnings only. But there are cases where the Local Governments or local authorities may desire that a line should be constructed which will not be remunerative on railway earnings and the construction of which is desired by them for purely local reasons on account of the administrative advantages it is likely to confer or for the development of a particular area. It is proposed that in future the Railway Board in such circumstances should have power to arrange for the construction of the line from railway funds if the Local Government or the local authority guarantees the Railway Board against loss. The guarantee would be to the effect that the local authority would make up the difference between the net earnings and the interest and other charges payable. As it is not desirable that the Central Government should make any profit out of such contributions by local authorities, it is also proposed that where contributions have been made by a local authority for this purpose the repayment of such contributions should be a first charge on any net profits subsequently realised from the line, should the line prove remunerative.

17. The Central Government must, however, retain the power to decide whether a line is to be built or not; the proposals in the preceding paragraph must not be taken to imply that a Local Government by giving a guarantee can require the Railway Board to construct a line. Proposals of a Local Government might run counter to the general railway policy or might take the form of short-circuiting railway traffic and so lead to a reduction of receipts from existing lines.

18. These proposals have been circulated to Local Governments and have been generally welcomed by them as affording a suitable method of reconciling central and local interests and of providing for local bodies and Local Governments a method of securing the construction of railways which may be required for purely local reasons, and which, while not likely to prove remunerative on purely railway earnings, are likely to provide such indirect benefits to Local Governments and local bodies as will more than repay the amounts paid under the guarantee. Several such arrangements have already been made with Local Governments.

Order.—Ordered that a copy of this Resolution be forwarded to all Local Governments and Administrations for information, to all Railway Administrations for information and guidance, and that the Resolution be published in the Supplement to the *Gazette of India* for general information.

J. IZAT,
Secretary, Railway Board.

GIPD—L IX-347—24-2-25—1,000.

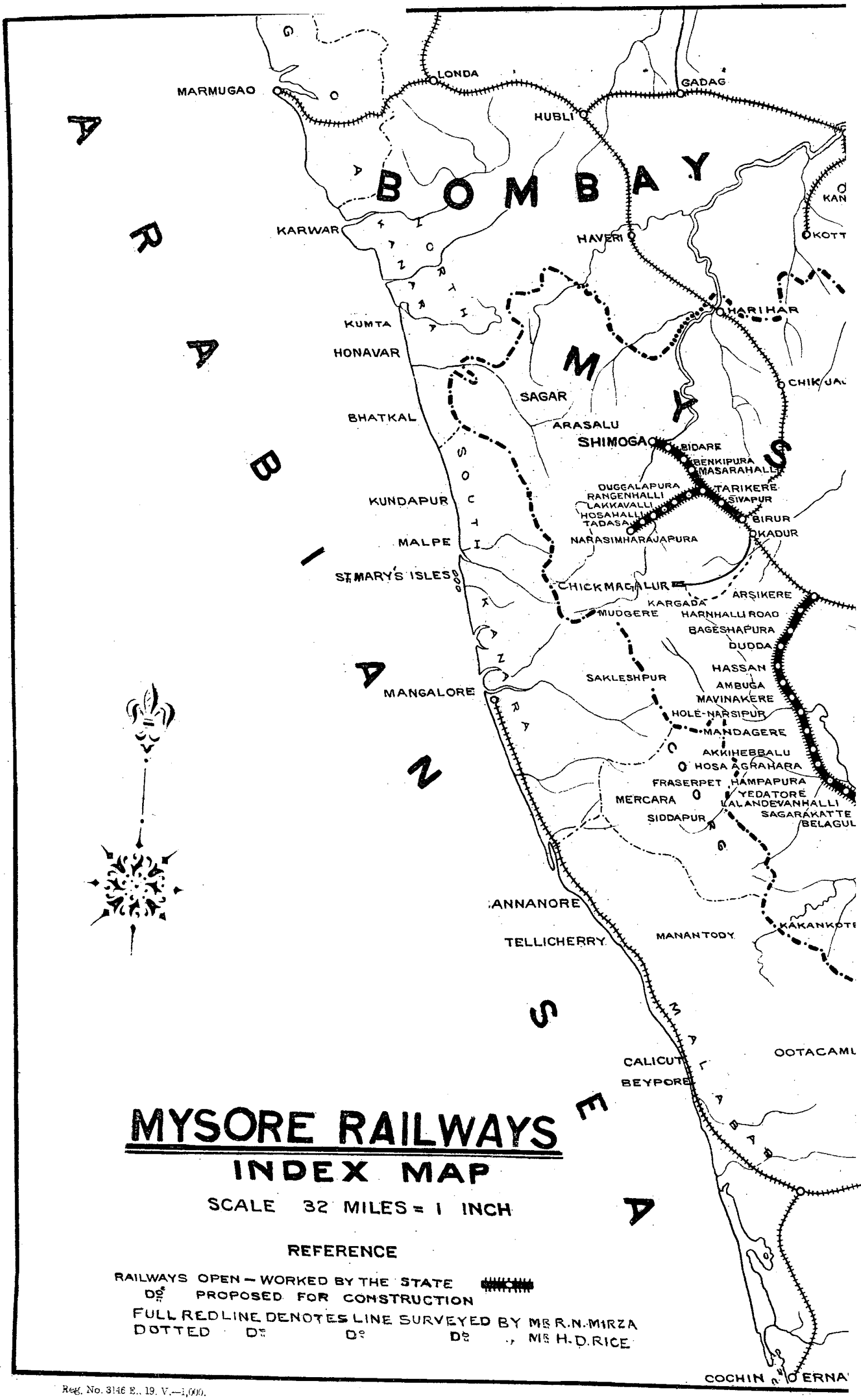
Mysore Railways

KADUR-CHIKMAGALUR RAILWAY

Length 28·82 Miles

Detailed Project Estimates

WD 894—GBPM—100—13-8-21



MYSORE RAILWAYS

INDEX MAP

SCALE 32 MILES = 1 INCH

REFERENCE

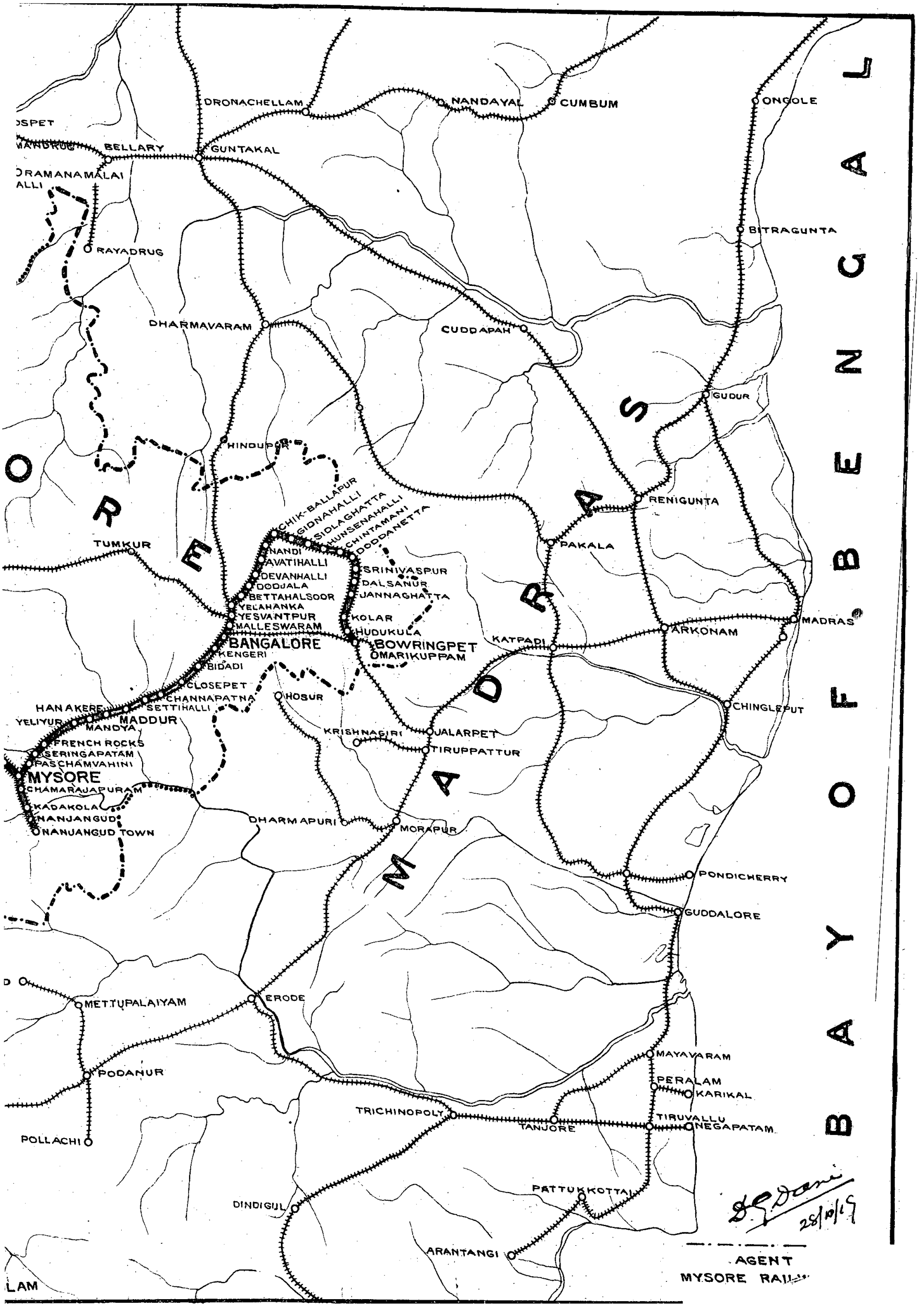
RAILWAYS OPEN — WORKED BY THE STATE

Dº PROPOSED FOR CONSTRUCTION

FULL RED LINE DENOTES LINE SURVEYED BY Mr R.N. MIRZA

DOTTED Dº Dº Dº Mr H.D. RICE

Reg. No. 3146 E., 19. V.—1,000.


BAY OF BENGAL
MADRAS
DRONACHELLAM
NANDAYAL
CUMBUM
ONGOLE
BELLARY
GUNTAKAL
RAYADRUG
DHARMAVARAM
CUDDAPAH
BITRAGUNTA
GUDUR
HINDUPUR
RENIGUNTA
PAKALA
TUMKUR
CHIK-BALLAPUR
GIDNAHALLI
SIDLAGHATTA
HUNSENAHALLI
CHINTAMANI
DODDANETTA
NANDI
AVATIHALLI
DEVANHALLI
DODJALA
BETTAHALSOOR
YELAHANKA
YESVANTPUR
MALLESWARAM
BANGALORE
KENGERI
BIDADI
SRINIVASPUR
DALSANUR
JANNAGHATTA
KOLAR
HUDUKULA
BOWRINGPET
OMARIKUPPAM
KATPADI
ARKONAM
CHINGLEPUT
CLOSEPET
CHANNAPATNA
HOSUR
HANAKERE
SETTIHALLI
YELIYUR
MADDUR
MANDYA
KRISHNAGIRI
VALARPET
TIRUPPATTUR
FRENCH ROCKS
SERINGAPATAM
PASCHAMVAHINI
MYSORE
CHAMARAJAPURAM
KADAKOLA
NANJANGUD
NANJANGUD TOWN
DHARMAPURI
MORAPUR
PONDICHERRY
GUDDALORE
METTUPALAIYAM
ERODE
MAYAVARAM
PERALAM
KARIKAL
PODANUR
TRICHINOPOLY
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DINDIGUL
ARANTANGI
AGENT
MYSORE RAIL

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NOTE

BY

Mr. D. G. DANI, B.Sc., F.C.H., M.Inst.C.E.,

Agent and Chief Engineer.

NOTE ON THE KADUR-CHIKMAGALUR RAILWAY PROJECT.

1. The report and project estimates for 1914 prepared by Mr. R. N. Mirza then Assistant Engineer, already printed with a note dated 10th March 1914 on same by Mr. E. A. S. Bell, Engineer-in-Chief, give full information about this project for an alignment on the direct route up to that period. This report and the note are reproduced herein as per Appendix I.

2. While the above report and project was under the consideration of Government, a proposal was made to connect Chikmagalur with Birur instead of with Kadur and an extract of Mr. Bell's letter dated 6th November 1914, as Secretary for Railways, is reproduced in Appendix II (*a*) from which it would appear that he did not view with favour the Chikmagalur-Birur connection.

3. This matter was again referred to Mr. C. Dove Wilson, the then Engineer-in-Chief, who expressed his views on same in his letter dated 22nd/23rd December, 1915, reproduced in Appendix II (*b*) in which after pointing out the difficulties about Chikmagalur-Birur direct connection, he suggested the investigation of a line through Hoskote pass.

4. As the survey of this line was not provided for in the survey programme for the year 1916-17, further investigation of same was held in abeyance as per Railway Secretary's note dated 29th May 1916 to the Government, *vide* Appendix II (*c*).

5. The question was again raised in September 1917 and my notes as Acting Secretary for Railways dated 12th September 1917 and 7th March 1918 *vide* Appendix II (*d* & *e*) give further developments in the matter.

6. In March 1918, Government sanctioned the re-investigation of this line from Kadur or Birur and my letter dated 4th—6th May 1918, *vide* Appendix II (*f*) as Agent gives further information about the survey then proposed to be carried out. Mr. Rice carried out this work in 1918-19, *viz.*, Kanvenhalli pass, and in his report and estimates he has given full information about the circuitous route followed by him and also made his own recommendations. His report and estimates are printed herewith in Part II.

7. In the Representative Assembly of October 1919, the representatives from Chikmagalur urged the construction of this line on the direct route from Kadur on the metre gauge alone and did not view with favour the construction of the line as surveyed by Mr. Rice *via* Kanvenhalli pass. In accordance with the promise made at the time, on the 17th October 1919, Mr. P. Raghavendra Rao, the then First Member of Council, presided over a meeting called by the Deputy Commissioner of that District at which the representatives of the District Board and other members interested in this scheme were present. The direct route from Kadur was strongly urged in this meeting also and it was agreed that a final location of the line as surveyed in 1914 should be made and a revised construction estimate prepared to suit the present day conditions, prevailing after the war. Mr. Mirza, Executive Engineer, was therefore placed in charge of this survey and was instructed to secure on the final location as easy a ruling gradient, fully compensated for curves, as was possible considering the difficult nature of the country.

8. The accompanying report and project estimates of the survey of 1919-20, prepared by Mr. Mirza give full information about this direct connection. Mr. Mirza's estimates give the cost of the whole line of 28·82 miles as Rs. 29,09,958 or a mileage rate of Rs. 1,00,970. He divided the whole length into three sections with their lengths, total cost and mileage rate as shown under:—

Section.		Miles.	Cost.	Rate per unit
1. Kadur to Heeragavaja	...	17·11	14,11,216	82,478
2 Heeragavaja to Veeranakanve	...	7·80	9,84,478	1,29,827
3. Veeranakanve to Chikmagalur	...	3·91	5,14,264	1,30,526

The last section includes Chikmagalur Station and station machinery and hence the mileage rate there is high.

9. I have carefully gone through the report and estimates of Mr. Mirza and consider same as prepared with care and have the following observations to make:—

(*a*) Before actual construction is taken up, the junction arrangements at Kadur should be settled with the M. S. M. Railway and the curve taking off from Kadur Station suitably altered.

(*b*) Some curves should be further eased off during construction if the grades and the ground permit.

(*c*) The station site at Chikmagalur should be finally approved by the District Board, Chikmagalur, before taking up any work on same.

(*d*) In the rates for cuttings, he considers soil below 20 feet as hard rock and provides for same at Rs. 90 per 1,000 c.ft. Hard rock may however appear below the surface at any depth and this assumption therefore requires consideration, during construction as borings have not been made during the survey.

(*e*) The rolling stock provision allowed at the rate of 12,000 rupees per mile may probably be found as insufficient due to the rise in the cost of foreign materials after the war. Actual traffic requirements should be worked out later on and the provision suitably altered in consultation with the Traffic and the Loco Departments.

(*f*) The above remark will also apply to materials required for Permanent Way and girders. The rates for the present are so fluctuating that it is best to revise them just before actual construction is decided on.

10. Mr. Rice's estimate for a circuitous route *via* Kanvenhalli of 38·73 miles are printed herewith in detail for information. The rates in same will however have to be revised due to the lapse of time since its preparation and the estimates brought up to date, if they have to be used for comparative purposes.

11. The traffic prospects for this line have been discussed in Mr. Bell's note of the 10th March 1914 (*vide* Appendix I) and have been further investigated by Mr. K. Raghavachar, Traffic Inspector in 1918 under instructions of Mr. Rice. The Traffic Inspector's report is printed as Appendix III. Mr. Rice has reviewed this report in paras 34 to 38 of his report of 1918-19 on the construction estimates printed herewith. I agree with him and Mr. Bell that the return on this construction will be poor but the line will open up a country which needs development most and bring more traffic to our main Bangalore-Harihar Section.

12. Mr. Mirza's new detailed estimates originally received required modifications before the same could be printed necessitating a delay in the early submission of these estimates.

13. The District Board of Kadur has been permitted to levy a railway cess in connection with the construction of this line and the amount so far collected may now be ascertained and further steps taken with that Board for the financing of this project.

14. Early sanction of Government to the project estimates as herewith submitted is requested.

MYSORE,
9th June 1921.

D. G. DANI, F.C.H., M.INST.C.E.,
Agent and Engineer-in-Chief.

PART I.

REPORT BY Mr. R. N. MIRZA, A.M.I.C.E., B.Eng., M.I.M.E.,

EXECUTIVE ENGINEER.

Kadur-Chikmagalur Railway.

1919-1920 PROJECT.

METRE GAUGE—LENGTH 28·82 MILES.

REPORT BY MR. R. N. MIRZA, A.M.I.C.E., B.ENG., M.I.M.E.,
EXECUTIVE ENGINEER.

I. PRELIMINARY.

The question of linking Kadur (Railway Station on the M. & S. M. Railway Bangalore and Poona Line) and Chikmagalur, has been under contemplation since 1893.

In the years 1912 and 1913, the writer of this report carried out a Metre Gauge Railway Survey from Kadur to Chikmagalur under the guidance of Mr. E. A. S. Bell, the then Engineer-in-Chief for Mysore Railway Construction Department. The Survey (28·33 miles long) ran through Dasarhalli Valley, and passed over Veeranakanve shoulder (over which the present Kadur-Chikmagalur P.W.D. Road also passes). It had a ruling gradient of 1 in 66·6 *uncompensated for curvature*. Full details of this survey are to be found in an already published report signed by Mr. Bell on 10th March 1914. (Appendix I)

In the year 1918, Mr. H. D. Rice, Superintending Engineer, Mysore Railway Surveys, suggested and carried out another Metre Gauge survey from Kadur and Chikmagalur *via* Kanvenhalli Pass and Karagada, compensated for curvature but 10 miles longer, the route not being direct, but deviating a great deal towards East, after leaving Sakrepatna to negotiate a pass, which will accept a 1 in 100 grade (compensated for curvature) development.

In both the above surveys, the ghat alignment was not finally staked out, and the estimates were prepared on cost estimated on the trace laid out on the detail chart prepared from exhaustive Theodolite surveys through the country, for which purpose a possible Railway line had to be first pegged out.

For further details of Mr. Rice's survey, reference is invited to his Survey Report.

In the year 1919, the Public and Coffee Planters of Chikmagalur requested the Durbar to link up Kadur and Chikmagalur *via* Veeranakanve, which is undoubtedly the shortest route. The Agent instructed the writer of this report to look into the matter once more

A survey party was sent out in December 1919 to survey the Dasarhally Valley. The Preliminary Survey work was done by means of a Theodolite. On the detail contour map, a trace was marked for 1 in 80 grade compensated for curvature, but this grade does not permit the line to reach the below ghat level at Heeragavaja. 1 in 70 grade was tried without success.

It was found that a 1 in 66·6 grade compensated for curvature, was the most suitable one for the nature of the country.

On 5th April 1920, the Agent, Mysore Railways, issued instructions to finally locate the line 1 in 66·6 grade compensated for curvature.

As per instructions, a 1 in 66·6 grade line compensated fully for curvature has been located on the ground and the curves set out. The whole line is demarcated by fixing granite stones (especially at apex points). The surface of Dasarhally Valley sides being hard and rocky, dock-bailing or trench marking has been done wherever it has been possible. Further, conical mounds of stone about 4½ feet in height have been built along the marked out route, about 400 to

500 feet apart. Bench mark stones have been left on rocks or fixed stones. The positions of such stones are shewn on the drawings giving plans and sections.

Regarding the other portions of the country, *viz.*, Kadur to Heeragavaja, and Veeranakanve to Chikmagalur, for purposes of estimate all the curves are compensated keeping the ruling grade as 1 in 66·6.

Gauge.

The gauge adopted is metre. This will prevent a break of gauge at Kadur and further some future day, the line may have to be linked up with a Malnad Railway line going from Hassan to Koppa *via* Sakleshpur and Mudigere. An independent 2'—6" gauge is certainly not to be recommended.

Fixed Point.

The fixed or starting point from which the mileage has to be reckoned, is 245 feet from the centre of Kadur Railway Station Building, and between the rails opposite the south-west corner of the existing Goods Shed

Levels.

The datum adopted is the mean sea level standard of the Survey of India. The M. & S. M. Railway level on rails at Kadur is taken as our starting Bench mark (see the Bench mark marked on platform coping stone at Kadur Station).

Length of Line.

The length of the whole line (as per latest survey) from Kadur to Chikmagalur is 28·82 miles and the whole length is in Kadur District. For the sake of estimating purposes, it has been divided into 3 sections, namely

(i) Kadur (mile zero) to Heeragavaja Station (miles 17·11);

(ii) From Heeragavaja Station (17·11) to Veeranakanve top of Ghat head (mile 24·91)=7·80 miles

(iii) Veeranakanve (24·91) to end of Chikmagalur Station (mile 28·82) = 3·91 miles.

II. LOCATION.

First Section—Kadur to Heeragavaja (village at bottom of Dasarhally Valley).—From zero the line runs on the M. & S. M. Railway siding for a distance of 425 feet and then it curves to the right till it approaches Kadur-Mangalore Road near furlong stone 5/132, chainage 12,000 feet. From here, it swings to the left that is, away from the road, to pass the village of Chennapur and Kamasagar. Then the alignment slightly turns to right till Ramanahalli Village is reached.

After leaving Ramanahalli, the alignment has to cross undulating countries till it reaches the first station Brahmasamudra. This third class type station is located very close to the Brahmasamudra Village. This village is of fair agricultural importance and after the Railway line is constructed, the village may give good traffic earnings.

Leaving Brahmasamudra Station, the line gradually rises 1 in 100. The line passing through dry land, reaches the village Sakrepatna. The distance between Brahmasamudra and Sakrepatna is 3·6 miles, and the rise is 198 feet.

The station is located within the fort and is quite close to the village. This station serves nearly 40 villages and is a most important station between Kadur and Chikmagalur. This is a third class station with Goods Shed. The writer is confident that this once important village will show good traffic earnings.

Leaving Sakrepatna Station, the line crosses the River Veda at chainage 65,000 (from Kadur about 500 feet to the left of the existing P. W. D. road bridge). For this river a 2-40 feet girder bridge has been provided. The line after crossing the River Veda runs parallel and close to the left hand side of the Kadur-Chikmagalur road till the Heeragavaja village is reached. The distance between Sakrepatna and Heeragavaja is 6 miles and the total rise from Kadur is 400·16.

Second or Middle Section—Heeragavaja to Veeranakanve.—(Veeranakanve means a small pass or shoulder through which the existing road traffic to Chikmagalur passes through, after having reached the top of Dasarhalli Valley).

The real ghat portion of the alignment may be said to commence from Heeragavaja. A third class station is provided close to this village. This station will serve Devarahalli, Bomenhalli, Latega and other villages. The line after leaving Heeragavaja Station takes a south-west direction alongside the village of Devarahalli and Bomenhalli and crosses the Kadur-Mangalore road at mile 19·91. The trace after crossing the road, enters the Dasarhalli Valley. The alignment runs along the right side of the valley looking towards Chikmagalur, (the curves not exceeding 16°) to pass by the small village Dasarhalli till the Hampapur gorge is reached.

There is a small temple near by called Ranganatha Temple which is visited by many annually. From Hampapur gorge the line swings towards south-east by a 16° curve to reach Veeranakanve.

At Veeranakanve saddle, ghat portion ends. The distance from Heeragavaja to ghat head is 7·80 miles and the rise between the two places is 550. It is owing to this large difference in level of 550 feet in 7·80 miles (railway route) that all the difficulty arises. To save heavy earthwork and banks, the writer made use of 16° curvature to negotiate the spurs and hollows on the sides of Dasarhalli Valley. In difficult country it is not unusual to adopt 16° curvature (358 feet radius) for metre gauge lines. On the Londa-Marmagoa Ghat Railway the expenditure in building numerous tunnels and heavy banks has been great, as they used 8° curves. The speed of a train in any case is restricted down a steady long gradient in ghat country.

Third Section—Veeranakanve (ghat-head) to Chikmagalur.—The line after leaving the ghat head (Veeranakanve) crosses the Kadur-Mangalore Road with a 6° curve, twice within 500 feet, hence the road has to be deviated to avoid unnecessary level crossings. Crossing the road, the line runs in a direction heading a good deal away to the right of Chikmagalur. This has been done to avoid the low lands below the bund of Basavanhalli tank close to Chikmagalur.

Passing the village of Bikanhalli and Kempanhalli, the alignment swings towards south and makes a circuit round Basavanhalli, crosses the Kadur-Chikmagalur Road near mile stone 153 and runs near to the existing shandy bazaar grounds where a station for Chikmagalur is proposed to be built. The Chikmagalur Station is located parallel to Santhepeta Road and close to shandy place. This station is a Second Class with Goods Shed and watering arrangements.

III. ALTERNATIVE ROUTES.

The line *via* Veeranakanve ghat needs no alteration in plain country as well as in ghats; for all possible trials have been made and best line is selected. It may be added that the writer has run nearly 5 different kinds of traces in Dasarhalli Valley since 1912.

IV. GRADIENTS AND CURVES.

Ruling Gradient.—The ruling gradient is 1 in 66·6 (1½%) and all curves compensated at the rate of ·03% per degree of curve. At this stage the writer wishes to add that the ruling grade on Mysore-Bangalore line is 1 in 70 overburdened with not only nasty curvature, but reverse curves also, and yet this line carries heavy traffic at high speed. A 1 in 66·6 grade need not be considered in any way alarming from traffic point of view. The question is, does it seriously affect the capacity of the line? After due consideration, the writer arrives at the conclusion that it does not, for the following reasons:—

(1) Such powerful locomotives are now-a-days built for metre guage traffic that they can haul up any such grades all kinds of heavy traffic. Such locomotives have a heavy tonnage per axle and for this reason 50 lbs. and 60 lbs. rail (in ghats) have been provided for in this estimate. Bangalore-Mysore line has only 41¼ lbs. rails, but M. & S. M. Railway Company are re-railing with heavier rails

now from Poona to Bangalore. In Great Britain, powerful engines haul heavy trains up and down the country on 1 in 50 grades, at high speeds.

(2) Speed is not such a vital factor in India and especially in a place like Kadur District. Fifteen minutes more or less does not matter, and even supposing we gave a 1 in 100 grade between Chikmagalur and Kadur, the distance will be 10 miles longer and it has to be seen, through what sort of country these 10 miles will run.

(3) There is another point of view which has to be studied and that is if any other route but through Veeranakanve is selected. Chikmagalur will be located as if on a branch line Railway. The writer feels sure that every one who has seen the place will agree with him in saying that Chikmagalur is a most promising place. It has an excellent climate (many think it even better than Bangalore), a big population, excellent trade facilities, and unique opportunities for the tourist and the shikari in the mountains and forests so close by. A survey was also carried out in 1912 by the writer from Kadur to Hassan *via* Chikmagalur, Belur and Alur and the writer cannot help carrying the conviction that had that line been built, it would have been a very well-paying line.

Curvature.

Sixteen degrees curve (*i.e.* of 358 feet radius) have been used in the ghats to negotiate the spurs and hollows and thus save heavy cuttings and banks. One important point has been well taken care of and that is the provision of 200 feet length straights between reverse curves, and this has further enabled the introduction of transition curves.

V. LABOUR, MATERIAL AND COMMUNICATION.

Labour.

There is a very great difficulty for labour in this district. During the survey works, the party was continuously troubled owing to the unwillingness on the part of the coolies to come to work. These labour people have small plots of land and they are satisfied with what little they have. Those who have not got lands are engaged by coffee planters. Therefore, labour will have to be imported from outside.

Material.

Good lime can be obtained at Hale-Lakkaya near Heeragavaja and also near Chikmagalur. There are no stone quarries near the line. Good granite-stone can be got at Kadur and at Chikmagalur, but Kadur stones are best. Sand can be had from Kadur locality; the Veda River sand (near Sakrepatna) is generally used, and for Chikmagalur the sand is brought from Mugalavalli about 6 or 7 miles away from Chikmagalur. There is no difficulty in getting good bricks. Stone and gravel ballast can be obtained easily along the line. Other materials such as roofing, flooring and other materials must be got from outside.

Communication.

For the purpose of bringing heavy materials and skilled labour, the proposed route is served by the existing Metre Guage at Kadur. There is also a P.W.D. road running from Kadur to Chikmagalur which at some places is quite close to the proposed line. Portions of the proposed route lie at a little distance from the road and are readily accessible by cart tracks. A motor service runs once a day from Kadur to Chikmagalur.

VI. ARRANGEMENT OF STAFF.

The whole line can be conveniently constructed by one Executive Engineer with two Sub-Divisions. Necessary subordinates and clerks have been provided. Temporary quarters are provided in the estimate.

VII. RELATIONS WITH PUBLIC AND GOVERNMENT DEPARTMENTS.

The proposed railway does not interfere with any Military ranges and camping grounds. For the roads under P.W.D., level crossings have been provided according to the nature of roads.

Stations have been provided at important places, namely:—

Brahmasamudra
Sakrepatna
Heeragavaja
Chikmagalur

with necessary arrangements.

Almost all the alignment has been made to pass through dry lands and only for 2 miles the line runs in wet and garden lands. The alignment adopted interferes very little with villages. The cost of acquisition of land except near Chikmagalur is moderate.

VIII. CONSTRUCTION AND ENGINEERING.

Standard Proposed. (Permanent Way).

The Standard proposed from Kadur to Heeragavaja is 50 lbs. rails, and from Heeragavaja to Chikmagalur with 60 lbs. rails.

Estimated Cost of Railway.

The total estimated cost of Railway is Rs. 28,75,557 or Rs. 99,776 per mile. The calculations are based on a revision of rates. If the line has to be built some years later, the rates, etc., should be carefully looked into once more.

Formation.

Formation width is greater than on the Mysore-Arsikere Railway. It is 16 feet on banks and 18 feet in cuttings. Side slopes of banks are 1½ to 1 and cutting 1 to 1. An allowance of 5 c.ft. per foot run is made for side drains and 5 c. ft. per foot run is made for catch drains. The same has been adopted after Mr. G. Richard's method for the Mysore-Coorg estimate.

Bridge Work.

There are three major bridges on the whole line and proper waterway has been provided. Two feet rail opening, 4 feet flat top, 6 feet arch, 20 arch and 12, 20, 30 and 40 feet girders have been adopted. Each bridge has been worked as per Stone's tables for Metre Gauge and the proper rates are given.

Fencing.

Wire fencing has been provided as usual for Chikmagalur Station and at level crossings. For other stations also, fencing is provided. To save over fencing at the beginning, old teak wood sleeper fencing may be given.

Permanent Way.

British standard flat-footed rails, 50 lbs. per yard on wooden sleepers are estimated from Kadur to Heeragavaja and 60 lbs. rails from Heeragavaja to Chikmagalur. The cost of one mile of both is worked out in detail as per rates secured from the Agent's Office.

Ballast.

The estimate provides for 10 cubic feet of stone or gravel ballast for the main line and 8 cubic feet for sidings. The rate adopted is 4 rupees per 100 cubic feet.

Stations and Buildings.

There are four stations on this line of which one is 2nd class and three 3rd class stations. Suitable lump sums are provided for stations and buildings

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which approximately agree with those built on Mysore-Arsikere Railway. Quarters for the staff such as Guards, Drivers, Loco-Foreman and others are provided in the estimate. A P. W. Inspector at Chikmagalur and S. W. Inspector at Sakrepatna are necessary. No administrative office is required as it exists at Mysore. No workshop for erecting rolling stock is necessary; rolling stock will be erected and repaired at Mysore Shops. Four hundred rupees per mile of Railway has been provided in the estimate to cover the cost of stores and workshops for the Permanent-Way Inspector and the Loco-Foreman. An engine shed is to be built at Birur Junction for two engines. Engines can run from the Junction to Chikmagalur and back.

PLANT.

There are no special important construction works and plant of special nature is not required. Even for major bridges on nalas, ordinary hand-pumps will do. A liberal provision has been allowed.

ROLLING STOCK.

An allowance of Rs. 12,000 per mile is made which will be sufficient to run one train from Kadur to Chikmagalur and back daily with spare goods vehicles. Details may be discussed later on with the Traffic Manager and the Carriage and Wagon Superintendent.

R. N. MIRZA.

Executive Engineer, Mysore Division,

11th January 1921. *Railways, Mysore.*

Kadur-Chikmagalur Railway.

PROJECT OF 1920.

METRE GAUGE—LENGTH 28·82 MILES.

NOTES ON RATES BY MR. R. N. MIRZA.

I. PRELIMINARY EXPENSES.

In the year 1913, an amount of Rs. 12,300 was sanctioned for pegging out the line *via* Veeranakanve Pass. Again in the year 1918, an amount of Rs. 7,000 was sanctioned for pegging out by Hoskote Pass.

A further sum of Rs. 5,500 was spent for investigating in Veeranakanve Ghat and final staking out in Ghat portions.

A lump sum of Rs. 5,700 has been provided for final survey before construction. The total amount comes to Rs. 33,000 and the rate per mile under different head is as follows:—

	Rate per mile.
(*a*) Survey Expenses ..	Rs. 200
(*b*) Plant	„ 100
(*c*) Establishment	„ 800

II. LANDS.

The rates for different classes of lands are obtained from the Revenue Authorities. 15 per cent has been added for compulsory acquisition of land and Rs. 80 per mile is provided for the cost of establishment engaged on acquisition.

III. FORMATION.

The rates have been carefully worked out after consulting different estimates on rates and also going over the rates supplied by P. W. D. I have adopted the following rates after due consideration:—

		Hard soil.	Soft soil,
		Rs.	Rs.
i.	Embankment up to 10 feet height, per 1,000 c.ft.	10	6
ii.	Embankment over 10 feet height, per 1,000 c.ft.	14	8
iii.	Embankment, trained earth for stationed yards and for topping banks, per 1,000 c.ft.	..	20
iv.	Cutting from 0-5 deep per 1,000 c.ft.	10	7
v.	Cutting from 5-10 deep per 1,000 c.ft.	15	9
vi.	Cutting from 10-15 deep per 1,000 c.ft.	20	12
vii.	Cutting from 15-20 deep per 1,000 c.ft.	30	..
viii.	Above 20 feet considered as hard rock	90	..
ix.	Repairing, turfing embankment, pitching slopes, etc.	10% of dimensions i. to ix.	
x.	Jungle clearing	50 per mile	
xi.	Service roads	100 per mile	
xii.	Sundries, lockspitting, centre line pillars, etc.	50 per mile	
xiii.	Road and Nalla diversions	50 per mile	

(*a*) Item iii includes an allowance of 20 cubic feet per foot run for repairing and topping all banks with selected material trained from cuttings or borrow pits. It also includes all earth required for making banks in station yards where borrow pits are not permissible.

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IV. Bridge Work.

Each bridge is worked in detail as per Stone's type for Metre Gauge.

V. Wire Fencing.

Wire fencing has been provided for Chikmagalur and for Kadur Junctions and also for level crossings. First class level crossing with gate lodge and gate has been estimated at Rs. 1,200 each. Second class,—only with gate and without gate lodge are estimated at Rs. 300. Third class level crossings with stone posts and chains at Rs. 75 each.

VII. Ballast and Permanent Way.

The price of the rails has been calculated from the rates quoted by Messrs. Tata & Co. The rates for fastenings are based on the present market rates. Mysore teak-wood sleepers are estimated at Rs. 6-4-0 and as per price given by the Conservator of Forests, 50 lbs. rails on Mysore teak-wood sleepers are estimated from Kadur to Heeragavaja and 60 lbs. rails from Heeragavaja to Chikmagalur. A detailed estimate of rates per mile has been worked out.

Ballast—Broken stone ballast and gravel can be obtained on the line and rate of Rs. 4 per 100 c.ft. is taken and Rs. 0-12-0 per 100 c.ft. for putting in the track is allowed.

VIII. Stations and Buildings.

Permanent station buildings and staff quarters are provided and lump sum rate are provided for buildings which would be built similar to already existing stations on M. A. Railway. The cost of different items under station machineries varies from time to time and a reasonable lump sum provision is made.

IX. Plant.

Necessary lump sum rate has been provided.

XI. Rolling Stock.

An accurate estimate of the number of vehicles required and cost of each is not possible for the present. A lump sum of Rs. 12,000 per mile has been made which will allow of the purchase of sufficient stock to run one train from Kadur to Chickmagalur and back daily with spare goods vehicles.

XII. General Charges.

The usual provision for Direction, Stores Audit, etc., is provided. The provision allowed for construction is two years. A detailed estimate has been prepared. The rate derived per mile for different heads is as follows:—

	Rate per mile. Rs.
(*a*) Direction	1,432
(*b*) Engineering	4,420
(*c*) Stores	296
(*d*) Audit and Accounts	176
(*e*) Medical and Sanitation	247
(*f*) Locomotives	
(*g*) Traffic	

R. N. MIRZA.

Executive Engineer,
Mysore Division, Railways.

11th January 1921.

KADUR-CHIKMAGLUR RAILWAY

GAUGE 3'-3⅜" LENGTH 28·82 MILES.

GENERAL ABSTRACT OF COST

Gauge 3'—3⅜

KADUR-CHIKMAGALUR

General Abstract

Heads of Account	Whole line Kadur-Chikmagalur 28·82 Miles								Kadur-Heeragavaja Section Mile 0 to Mile 17·11			
	Cost exclusive of junction				Cost of junction		Cost including junction		Cost exclusive of junction			
	Sub-head		Main-head		Main-head		Main-head		Sub-head		Main-head	
	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
I. Preliminary expenses	..	..	33,143	1,150	All works connected with junction arrangements at Kadur will be carried out by the Madras and Southern Mahratta Railway Company under a separate estimate, funds being provided by the Mysore Government in the usual course.		33,143	1,150	..	..	19,676	1,150
(a) Survey expenses	5,864	200	..	..			..	..	3,422	200	..	..
(b) Plant ..	2,882	100	..	..			..	..	1,711	100	..	..
(c) Establishment ..	24,497	850	..	..			..	..	14,543	850	..	..
II. Land ..	..	..	76,006	2,637			76,006	2,637	..	..	30,828	1,802
III. Formation ..	..	..	4,32,113	14,993			4,32,113	14,993	..	..	1,06,155	6,204
(a) Earthwork ..	4,19,796	14,566	..	..			..	..	1,01,981	5,960	..	..
(b) Tunnels ..	..	..	..	..			..	..	..	..	..	..
(c) Walling ..	1,102	38	..	..			..	..	..	..	..	..
(d) Side drains ..	11,215	389	..	..			..	..	4,174	244	..	..
IV. Bridge work ..	..	..	2,53,152	8,784			2,53,152	8,784	..	..	1,14,091	6,668
(a) Major bridges	37,893	1,315	..	..			..	..	31,275	1,828	..	..
(b) Minor bridges ..	2,15,259	7,469	..	..			..	..	82,816	4,840	..	..
V. Fencing ..	..	..	22,508	781			22,508	781	..	..	13,060	763
(a) Fencing ..	13,424	466	..	..			..	..	8,887	519	..	..
(b) Road crossings ..	6,379	221	..	..			..	..	2,756	161	..	..
(c) Mile and gradient posts.	2,705	94	..	..			..	..	1,417	83	..	..
VI. Electric telegraph	..	..	..	..			..	..	..	..	..	..
VII. Ballast and permanent way.	..	..	12,91,547	44,815			12,91,547	44,815	..	..	6,83,220	39,931
(a) Main line. i. Permanent way.	10,84,673	37,636	..	..			..	..	5,67,470	33,166	..	..
(a) Main line. ii. Ballast ..	75,883	2,633	..	..			..	..	45,051	633	..	..
(b) Siding i. Permanent way.	1,16,393	4,039	..	..	..		..	..	63,281	3,698	..	..
(b) Siding ii. Ballast ..	6,798	236	..	..	..		..	..	4,018	235	..	..
(c) Points and crossings.	7,800	271	..	..	..		..	..	3,400	199	..	..
VIII. Stations and buildings.	..	..	1,80,946	6,279	57,918	2,009	2,38,864	8,288	..	..	52,246	3,053
(a) Stations and offices.	41,265	1,432	..	..	..	..	..	..	13,440	786	..	..
(b) Workshops, store buildings, etc,	11,528	400	..	..	..	..	..	..	6,844	400	..	..
(c) Staff quarters ..	66,255	2,299	..	..	..	..	..	..	23,625	1,380	..	..
(d) Station Machinery	61,898	2,148	..	..	..	..	..	..	8,337	487	..	..
IX. Plant	..	..	33,720	1,170	..	..	33,720	1,170	..	..	20,019	1,170
(a) Engineering ..	4,323	150	..	..	..	..	..	..	2,567	150	..	..
(b) Construction, etc,	11,528	400	..	..	..	..	..	..	6,844	400	..	..
(c) Locomotive ..												
(d) Carriage and waggon.	14,410	500	..	..	..	..	..	..	8,555	500	..	..
(e) Station and office furniture.	3,459	120	..	..	..	..	..	..	2,053	120	..	..
X. Ferries, etc. ..	..	..	..	..	..	..	..	..	..	..	..	..
XI. Rolling stock	..	..	3,45,840	12,000	..	..	3,45,840	12,000	..	..	2,05,320	12,000
(a) Locomotive ..	1,15,280	4,000	..	..	..	..	..	..	68,440	4,000	..	..
(b) Carriage and waggon.	2,30,560	8,000	..	..	..	..	..	..	1,36,880	8,000	..	..
XII. General charges	..	..	1,83,065	6,352	..	..	1,83,065	6,352	..	..	1,08,683	6,352
(a) Direction	39,456	1,369	..	..	..	..	..		23,424	1,369	..	..
(b) Engineering	1,23,204	4,275	..	..	..	..	..		73,145	4,275	..	..
(c) Stores	8,390	291	..	..	..	..	..		4,979	291	..	..
(d) Audit and accounts.	5,015	174	..	..	..	..	..		2,977	174	..	..
(e) Medical and Sanitation.	7,000	243	..	..	..	..	..		4,158	243	..	..
(f) Locomotive ..	..	..	..	..	..	..	..		..	..	..	..
(g) Traffic ..	..	..	..	..	..	..	..		..	..	..	..
Grand total ..	..	..	28,52,040	98,961	57,918	2,009	29,09,958	100970	..	..	13,53,298	79,093

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RAILWAY. **28.82 Miles.**

of cost.

Kadur-Heeragavaja Section Mile 0 to Mile 17·11				Heeragavaja-Veeranakanave Section Mile 17·11 to Mile 24·91				Veeranakanave-Chikmagalur Section Mile 24·91 to Mile 28·82			
Cost of junction		Cost including junction									
Main-head		Main-head		Sub-head		Main-head		Sub-head		Main-head	
Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile	Amount	Rate per Mile
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
	..	19,676	1,150	..	..	8,970	1,150	..	..	4,497	1,150
	..	..	..	1,560	200	..	..	782	200	..	..
	..	..	..	780	100	..	..	391	100	..	..
	..	..	..	6,630	850	..	..	3,324	850	..	..
	..	30,828	1,802	..	..	4,640	595	..	..	40,538	10,368
	..	1,06,155	6,204	..	..	2,59,857	33,314	..	..	66,101	16,906
	..	..	..	2,53,347	32,480	..	..	64,468	16,488	..	..
	..	..	..	..	..	..	..	..	..	..	..
	..	..	..	1,102	141	..	..	..	..	..	..
	..	..	..	5,408	693	..	..	1,633	418	..	..
	..	1,14,091	6,668	..	..	1,15,367	14,791	..	..	23,694	6,060
	..	..	..	..	..	..	..	6,618	1,693	..	..
	..	..	..	1,15,367	14,791	..	..	17,076	4,367	..	..
	..	13,060	763	..	..	4,145	532	..	..	5,303	1,356
	..	..	..	1,200	154	..	..	3,337	854	..	..
	..	..	..	2,048	263	..	..	1,575	402	..	..
	..	..	..	897	115	..	..	391	100	..	..
	..	..	..	..	..	..	..	..	..	..	..
	..	6,83,220	39,931	..	..	4,02,014	51,540	..	..	2,06,313	52,765
	..	..	..	3,59,876	46,138	..	..	1,57,327	40,237	..	..
..	..	..	..	20,537	2,633	..	..	10,295	2,633	..	..
..	..	..	..	18,911	2,424	..	..	34,201	8,747	..	..
..	..	..	..	990	127	..	..	1,790	457	..	..
..	..	..	..	1,700	218	..	..	2,700	691	..	..
57,918	3,385	1,10,164	6,438	..	..	37,213	4,783	..	..	91,487	23,399
..	..	..	..	6,142	787	..	..	21,683	5,545	..	..
..	..	..	..	3,120	400	..	..	1,564	400	..	..
..	..	..	..	9,870	1,278	..	..	32,760	8,380	..	..
..	..	..	..	18,081	2,318	..	..	35,480	9,074	..	..
..	..	20,019	1,170	..	..	9,126	1,170	..	..	4,575	1,170
..	..	..	..	1,170	150	..	..	586	150	..	..
..	..	..	..	3,120	400	..	..	1,564	400	..	..
..	..	..	..	3,900	500	..	..	1,955	500	..	..
..	..	..	..	936	120	..	..	470	120	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	2,05,320	12,000	..	..	93,600	12,000	..	..	46,920	12,000
..	..	..	..	31,200	4,000	..	..	15,640	4,000	..	..
..	..	..	..	62,400	8,000	..	..	31,280	8,000	..	..
..	..	1,08,683	6,352	..	..	49,546	6,352	..	..	24,836	6,352
..	..	..	..	10,679	1,369	..	..	5,353	1,369	..	..
..	..	..	..	33,344	4,275	..	..	16,715	4,275	..	..
..	..	..	..	2,270	291	..	..	1,138	291	..	..
..	..	..	..	1,357	174	..	..	680	174	..	..
..	..	..	..	1,896	243	..	..	950	243	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
57,918	3,385	14,11,216	82,478	..	..	9,84,478	129827	..	..	5,14,264	130526

All works connected with junction arrangements at Kadur will be carried out by the Madras and Southern Mahratta Railway Company under a separate estimate, funds being provided by the Mysore Government in the usual course.

KADUR-CHIKMAGALUR RAILWAY

GAUGE 3'—3⅜". LENGTH 28·82 MILES.

DETAILED ESTIMATES

Gauge 3'-3⅜" **KADUR-CHIKMAGALUR RAILWAY.** 28·82 Miles.

I.—Preliminary Expenses.

Sub-heads	Whole line 28·82 miles		Kadur to Heeragavaja 0 to 17·11 miles		Heeragavaja to Veeranakanave 17·11 to 24·91 miles		Veeranakanave to Chikmagalur 24·91 to 28·82 miles	
	Rate per mile	Total cost	Rate per mile	Total cost	Rate per mile	Total cost	Rate per mile	Total cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
(*a*) Survey Expenses ..	200	5,764	200	3,422	200	1,560	200	782
(*b*) Plant	100	2,882	100	1,711	100	780	100	391
(*c*) Establishment ..	850	24,497	850	14,543	850	6,630	850	3,324
Total ..	1,150	33,143*	1,150	19,676	1,150	8,970	1,150	4,497

* See details in the note on rates.

II.—Land.

Description	Unit	Rate	Whole line 28·82 miles		Kadur to Heeragavaja 17·11 miles		Heeragavaja to Veeranakanave 7·80 miles		Veeranakanave to Chikmagalur 3·91 miles	
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
		Rs.	Acres	Rs.	Acres	Rs.	Acres	Rs.	Acres	Rs.
Chikmagalur Town lands	Acre	1,000	19	19,000	..	..	..	..	19	19,000
Compensation for houses at Chikmaglur.	Lump sum		..	10,000	..	..	..	..	L. S.	10,000
Mango gardens ..	Acre	500	3·55	1,775	3·55	1,775	..	..	..	..
Garden land ..	Do	1,000	2·17	2,170	2·17	2,170	..	..	..	..
Wet lands ..	Do	200	9·76	1,952	9·76	1 952	..	..	..	..
Dry lands ..	Do	100	199·8	19,980	139·8	13,980	32	3,200	28	2,800
Lands unirrigated and waste.	Do	50	42·26	5,613	83·26	4,163	..	..	29	1,450
Compensation for trees huts, etc.	Lump sum		..	450	L. S.	300	L. S.	100	L. S.	50
Extra for compulsory acquisition at 15 per cent.	..	..	..	9,141	..	3,651	..	495	..	4,995
Establishment for acquisition at Rs. 80 per mile.	Mile	80	28·82	2,306	17·11	1,369	7·80	624	3·91	313
Total cost ..	..	..	..	72,387	..	29,360	..	4,419	..	38,008
Contingencies at 5 per cent.	..	..	..	3,619	..	1,468	..	221	..	1,930
Grand total ..	..	..	..	76 006	..	30,828	..	4,640	..	40,538
Rate per mile ..	..	..	..	2,637	..	1,802	..	595	..	10,368

III.—Formation.

Description	Whole line 28·82 miles		Kadur to Heeragavaja 17·11 miles		Heeragavaja to Veeranakanave 7·80 miles		Veeranakanave to Chikmagalur 3·91 miles	
	Total cost	Mean rate per mile	Total cost	Mean rate per mile	Total cost	Mean rate per mile	Total cost	Mean rate per mile
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
(*a*) Earthwork ..	4,19,796	14,566	1,01,981	5,960	2,53,347	32,480	64,468	16,488
(*c*) Walling ..	1,102	38	...	..	1,102	141	...	...
(*d*) Side drains ..	11,215	389	4,174	244	5,408	693	1,633	418
Total III Formation ..	4,32,113	14,993	1,06,155	6,204	2,59,857	33,314	66,101	16,906

Gauge 3'—3$\frac{3}{8}$"

KADUR-CHIKMAGALUAR RILWAY.

Length 28·82 Miles.

III.—Formation.

(*a*) *Earth Work.*

Description	Unit	Rate	Whole line 28·82 miles		Kadur to Heeragavaja 17·11 miles		Heeragavaja to Veeranakanave 7·80 miles		Veeranakanave to Chikmagalur 3·91 miles	
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Embakment including Station yards—		Rs.								
Embankment up to 10 feet high	1,000 c. ft.	6	49,63,828	29,783	49,63,828	29,783	..	..	..	..
Embankment up to 10 feet high	Do	10	27,69,412	27,695	..	..	17,05,213	17,052	10,64,199	10,643
Embankment over 10 feet high	Do	8	15,80,672	12,645	15,80,672	12,645	..	..	..	..
Embankment over 10 feet high	Do	14	39,55,039	55,367	..	..	30,58,596	42,818	8,96,443	12 549
Embankment trained earth.	Do	20	21,08,052	42,160	13,72,800	27,456	3,71,800	7,436	3,63,452	7,268
Cutting earth including Station yards—										
Cutting earth 0-5 feet deep	Do	7	16,35,805	11,451	16,35,805	11,451	..	..	..	..
Cutting earth 0-5 feet deep	Do	10	44,73,855	44,738	..	..	34,45,438	34,454	10,28,422	10,284
Cutting earth 5-10 feet deep	Do	9	2,69,733	2,428	2,69,733	2,428	..	..	..	..
Cutting earth 5-10 feet deep	Do	15	21,83,633	32,754	..	..	18,00,275	27,004	3,83,358	5,750
Cutting earth 10-15 feet deep	Do	12	42,766	513	42,766	513	..	..	..	..
Cutting earth 10-15 feet deep	Do	20	10,53,181	21,064	..	..	8,57,280	17,146	1,95,901	3,918
Cutting earth 15 20 feet deep	Do	30	5,90,659	17,720			5,22,902	15,687	67,757	2,033
Rock cutting	Do	50	44,105	2,205			..	..	44,105	2,205
Rock cutting	Do	90	6,18,858	55,697		..	6,18,858	55,697	..	..
Maintenance at 10 per cent of above items.	..	..	..	35,622		8.428	..	21,729	..	5,465
Service Roads	Mile	00	28·82	2,882	17·11	1,711	7·80	780	3·91	391
Jungle clearing	Do	50	28·82	1,441	17·11	855	7·80	390	3·91	196
Nala and road diversions	Lump sum	..	..	2,200	..	1,000	..	700	..	500
Lockspitting, centre line pillars, etc.	Mile	50	28·82	1,441	17·11	855	7·80	390	3·91	196
Total				3,99,806		97,125	..	2,41,283	..	61,398
Add for contingencies at 5 per cent				19,990		4,856	..	12,064	..	3,070
Grand total				4,19,796		1,01,981	..	2,53,347	..	64,468
Rate per mile				14,566		5,960	..	32,480	..	16,488

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Gauge 3'—3⅜" **KADUR-CHIKMAGALUR RAILWAY.** 28·82 Miles.

Details of Bank in Miles.

(Including Station yards.)

Miles	Section of Railway	Up to 10 ft. high at Rs. 6 or Rs. 10 per 1,000 c.ft.		Over 10 ft. high at Rs. 8 or Rs. 14 per 1,000 c.ft.		Trained earth, etc., at Rs. 20 per 1,000 c.ft.	
		Quantity	Cost	Quantity	Cost	Quantity	Cost
1	Kadur-Heeragavaja Section	279,078	1,674	...	...	78,000	1,560
2		203,665	1,222	...	...	82,000	1,640
3		250,869	1,505	...	...	96,000	1.920
4		287,333	1,724	84,894	679	86,000	1,720
5		121,605	730	...	...	68,000	1,360
6		202,803	1,217	...	...	58,000	1,160
7		214,600	1,288	...	...	62,000	1,240
8		257,344	1,544	...	...	94,000	1,880
9		357,509	2,145	...	...	78,000	1,560
10		166,621	1,000	...	...	70,000	1,400
11		391,711	2,350	475,258	3,802	58,300	1,160
12		298,138	1,789	351,272	2,810	72,000	1,440
13		287,519	1,725	411,963	3,296	82,000	1,640
14		323,346	1,940	...	...	76,000	1,520
15		209,037	1,254	...	...	62,000	1,240
16		350,700	2,104	...	...	60,000	1,200
17		238,515	1,431	33,814	271	66,000	1,320
17·11		72,178	433	79,774	638	...	...
Total ...		4,512,571	27,075	1,436,975	11,496	1,248,000	24,960
Add 10 per cent for settlement ...		451,257	2,708	143,697	1,149	124,800	2,496
Grand total		4,963,828	29,783	1,580,672	12,645	1,372,800	27,456
18	Heeragavaja-Veeranakanave Section	396,565	3,966	...	...	66,000	1,320
19		187,218	1,872	111,125	1,555	42,000	840
20		177,805	1,778	591,666	8,283	60,000	1,200
21		58,187	582	...	...	10,000	200
22		91,964	920	...	...	22,000	440
23		151,835	1,518	278,451	3,898	50,000	1,000
24		400,459	4,004	442,900	6,200	48,000	960
25		86,160	862	1356,400	18,989	40,000	800
Total ...		1,550,193	15,502	2,780,542	38,925	338,000	6,760
Add 10 per cent for settlement ...		155,020	1,550	278,054	3,893	33,800	676
Grand total		1,705,213	17,052	3,058,596	42,818	371,800	7,436
26	Veeranakanave-Chikmagalur Section	158,108	1,581	193,938	2,715	34,000	680
27		267,170	2,672	545,918	7,643	54,000	1,080
28		519,997	5,200	75,093	1,051	52,000	1,040
28·82		22,179	222	...	...	190,411	3,808
Total ...		967,454	9,675	814,949	11,409	330,411	6,608
Add 10 per cent for settlement ...		96,745	968	81,494	1,140	33,041	660
Grand total		1,064,199	10,643	896,443	12,549	363,452	7,268
Grand total for whole line		7,733,239	57,478	5,535,707	68,012	2,108,052	42,160

Gauge 3'—3⅜"

KADUR-CHIKMAGALUR RAILWAY.

28·82 Miles

Details of Cutting for each Mile.

(Including Station yards.)

Miles	Section of Railway	Earth from 0 to 5 feet deep				Earth from 5 to 10 feet deep				Earth from 10 to 15 feet deep				Earth from 15 to 20 feet deep				Rock Cutting			
		At Rs. 7 per 1,000 c. ft.		At Rs. 10 per 1,000 c. ft.		At Rs. 9 per 1,000 c. ft.		At Rs. 15 per 1,000 c. ft.		At Rs. 12 per 1,000 c. ft.		At Rs. 20 per 1,000 c. ft.		At Rs. 15 per 1,000 c. ft.		At Rs. 30 per 1,000 c. ft.		At Rs. 50 per 1,000 c. ft.		At Rs. 90 per 1,000 c. ft.	
		Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
			Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.
1	Kadur-Heeragavaja Section.	15,796	111	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2		84,646	593	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3		15,198	106	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4		4,599	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5		119,871	837	..	..	5,828	52	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6		268,805	1,883	..	..	122,412	1,102	..	..	7,644	92	..	..	..	..	..	..	..	..	..	..
7		176,638	1,237	..	..	17,216	155	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8		241,631	1,692	..	..	2,873	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9		42,050	294	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10		26,271	184	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11		41,709	292	..	..	9,061	82	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12		138,071	967	..	..	4,025	36	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13		59,906	419	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14		60,310	422	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15		70,907	496	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16		222,171	1,555	..	..	108,318	975	..	..	35,122	421	..	..	..	..	..	..	..	..	..	..
17		47,226	331	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17·11		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	1,635,805	11,451	..	..	269,733	2,428	..	..	42,766	513	..	..	..	..	..	..	..	..	..	..
18	Heeragavaja-Veeranakanave Section.	..	..	217,054	2,170	..	..	105,450	1,581	..	..	19,437	389	..	..	..	..	..	..	..	..
19		..	..	222,317	2,223	..	..	47,400	711	..	..	..	..	..	..	..	..	..	..	..	..
20		..	..	189,204	1,892	..	..	50,314	755	..	..	..	..	..	..	..	..	..	..	..	..
21		..	..	682,910	6,829	..	..	356,976	5,355	..	..	98,285	1,966	..	..	26,702	801	..	..	..	..
22		..	..	381,397	3,814	..	..	82,360	1,235	..	..	2,509	50	..	..	..	..	..	..	8,100	729
23		..	..	329,235	3,292	..	..	143,611	2,154	..	..	52,249	1,045	..	..	27,200	816	..	..	437,758	39,398
24		..	..	839,861	8,399	..	..	611,854	9,178	..	..	442,000	8,840	..	..	314,000	9,420	..	..	173,000	15,570
225		..	..	583,460	5,835	..	..	402,310	6,035	..	..	242,800	4,856	..	..	155,000	4,650	..	..		
25	Total ..	..	..	3,445,438	34,454	..	..	1,800,275	27,004	..	..	857,280	17,146	..	..	522,902	15,687	..	..	618,858	55,697
26	Veerana-kanave Chik-magalur Section.	..	..	559,641	5,596	..	..	346,303	5,195	..	..	195,901	3,918	..	..	67,757	2,033	44,105	2,205	..	..
27		..	..	126,876	1,269	..	..	19,850	297	..	..	..	..	..	..	..	..	..	..	..	..
28		..	..	172,285	1,723	..	..	11,473	172	..	..	..	..	..	..	..	..	..	..	..	..
28·82		..	..	169,620	1,696	..	..	5,732	86	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	1,028,422	10,284	..	..	383,358	5,750	..	..	195,901	3,918	..	..	67,757	2,033	44,105	2,205	..	..
	Grand total for whole line ..	1,635,805	11,451	4,473,860	44,738	269,733	2,428	2,183,633	32,754	42,766	513	1,053,181	21,064	..	..	590,659	17,720	44,105	2,205	618,858	55,697

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Gauge 3″—3⅜″ **KADUR-CHIKMAGALUR RAILWAY.** **28·82 Miles.**

III. Formation.

(c) Walling.

Description	Unit	Rate	Whole line 28·82 miles		Kadur to Heeragavaja 17-11 miles		Heeragavaja to Veeranakanve 7·80 miles		Veernakanve to Chikmagalur 3·91 miles	
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
	C.ft.			Rs.		Rs.		Rs.		Rs.
Walling	100	30	3,500	1,050	..	..	3,500	1,050	...	...
Total ..				1,050	...		1,050		.	
Add for contingencies at 5 % ..				52	...		52		..	
Grand total ...				1,102	...		1,102		..	
Rate per mile Rs. ..				38	...		141		..	

(d) Side drains.

Description	Unit	Rate	Whole line 28·82 miles		Kadur to Heeragavaja 17·11 miles		Heeragavaja to Veeranakanave 7·80 miles		Veeranakanave to Chikmagalur 3·91 miles	
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
	C.ft.	Rs.		Rs.		Rs		Rs.		Rs.
Side drains in earth.	1,000	10	874,100	8,741	397,500	3,975	341,100	3,411	135,500	1,355
Side drains in Hard Soil.	,,	20	26,800	536	..	..	16,800	336	10,000	200
Side drains in Rock.	,,	30	15,600	1,404	..	...	15,600	1,404	..	..
Total ..				10,681		3,975		5,151		1,555
Add for contingencies 5% ...				534		199		257		78
Grand total ..				11,215		4,174		5,408		1,633
Mean rate per mile ...				389		244		693		418

Gauge 3'—3⅜". KADUR-CHIKMAGALUR RAILWAY 28·82 Miles.

Details of side and catch water drains.

Miles	Section of Railway	In Earth at Rs. 10 per 1,000 c.ft.		In Hard soil at Rs. 20 per 1,000 c.ft.		In Rock at Rs. 90 per 1,000 c.ft.	
		Quantity	Cost	Quantity	Cost	Quantity	Cost
			Rs.		Rs		Rs.
1	Kadur-Hoéragavaja Section	19,500	195				
2		18,000	180				
3		6,000	60				
4		10,500	105				
5		28,500	285				
6		36,000	360				
7		33,000	330				
8		34,500	345				
9		21,000	210				
10		27,000	270				
11		6,000	60				
12		24,000	240				
13		16,500	165				
14		22,500	225				
15		33,000	330				
16		33,000	330				
17		28,500	285				
11							
Total		397,500	3,975				
18	Heragavaja-Veeranakanave Section	12,300	123	1,200	24		
19		46,800	468	1,200	24		
20		27,000	270	..			
21		65,400	654	6,600	132		
22		64,500	645				
23		44,400	444	..		3,600	324
24		39,600	396	4,200	84	7,200	648
25		41,100	411	3,600	72	4,800	432
Total		341,100	3,411	16,800	336	15,600	1,404
26	Veerana-kanave Chik-magalur Section	42,500	425	10,000	200		
27		22,500	225				
28		36,000	360				
28·82		34,500	345				
Total		135,500	1,355	10,000	200		
Grand total for whole line		874,100	8,741	26,800	536	15,600	1,404

IV. Bridge Work.

(a) *Major Bridge.*

Section of Railway Mileage			Kadur to Heeragavaja mile 0 to 17·14						Veeranakanave to Chikmagalur mile 24·91 to 28·82				Whole line Kadur to Chikmagalur mile 0-28·82 miles	
			6·38		12·31		Totals				Totals		Totals	
Description of work	Unit	Rate	Bukasara Valley 4-20 girders		Varada River 2-40 girder		Water way 160 lineal feet		3-20 girders		Water way 60 lineal feet		Water way 220·1 lineal feet	
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
		Rs.		Rs.		Rs.		Rs.		Rs.		Rs		Rs.
1. Earth work including excavation filling and backing	1,000 C.ft.	15	8,746	132	45,598	684	54,344	816	7,700	116	7,700	116	62,044	932
2. Concrete	100 ,,	26	2,319	604	5,819	1,513	8,138	2,117	1,970	513	1,970	513	10,108	2,630
3. Masonry	100 ,,	37	5,465	2,023	33,506	12,398	38,971	14,421	4,674	1,730	4,674	1,730	43,645	16,151
4. Coping	100 ,,	200	150	300	278	556	428	856	133	266	133	266	561	1,122
5. Bed slabs	100 ,,	200	84	168	20	40	104	208	74	148	74	148	178	356
6. Girders	Ton	300	10·32	3,096	16·33	4,899	26·65	7,995	7·74	2,322	7·74	2,322	3,439	10,317
7. Timber	C.ft.	7	123	896	120	840	248	1,736	96	672	96	672	344	2,408
8. Lead sheeting, washers, bolts, nuts, etc.	Lump	sum	..	80	L.S.	150	L.S.	..	L.S.	80	..	80	L.S.	310
9. Baling water	Do	..	..	200	Do	200	..	..	..	200	..	200		600
10. Clearing channel, etc. ..	Do	..	..	80	Do	100	..	..	..	80	..	80		260
11. Unforeseen charges ..	Do	..	..	227	Do	641	..	868	..	185	..	185		1053
Total ..				7,806		22,021		29,827		6,312		6,312		36,139
Add for contingencess at 5% ..				379		1,069		1,448		306		306		1,754
Total cost of bridge ..				8,185		23,090		31,275		6,618		6,618		37,893
Cost per lineal foot of water way ..				102		289		195		331		331		172
Cost per mile. ...								1,828		...		1,693		1,315

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Gauge 3′—3⅜″.

KADUR-CHIKMAGALUR RAILWAY

28·82 Miles.

IV. Bridges.-

(b) Minor Bridges costing more than Rs: 5.000

Serial No	Section of Railway	Chainage	Height of Bank	Description	R. ft. of water way	Earth work	Concrete	Masonry	Arch work and coping	Flooring	Girders in tons	Bed blocks	Wood work	Total cost
				Rate		Rs. 15 per 1,000 c.ft.	Rs. 26 per 100 c.ft.	Rs. 37 per 100 c.ft.	Rs 200 per 100 c.ft.	Rs. 15 per 100 c.ft.	Rs. 300 per ton	Rs 200 per 100 c.ft	Rs. 7 per c.ft.	
19	Kadur Heeragavaja Section.	17,000	15·00	One girder 30 feet	30	14,402	2,433	8,976	155	2,223	6·00	20·00	46·0	6,975
20		49,300	20·00	One girder 20 feet	20	20,872	3,288	13,661	195	2,668	2·58	17·50	32·0	8,045
22		54,133	15·00	Two girders 20-feet	40	14,116	2,744	9,384	172	-2,942	5·16	35·00	64·0	7,248
23		56,400	18·00	One arch 10 feet	10	9,485	1,885	5,730	1,044	1,080	..	..	..	5,008
39		86,105	18·00	Two girders 12 feet	24	16,035	2,935	11,460	193	2,689	2·64	30·00	40·0	7,165
				Total	124									34,441
				Add 5 per cent for contingencies	..									1,722
				Total	124									36,163
				Add cost of bridges less than Rs. 5,000	266									46,653
				Total for Kadur-Heeragavaja Section	390									82,816
				Rate per mile	..									4,840

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VI Bridges.

(b) *Minor Bridges Costing more than Rs. 5,000.*

Serial No.	Section of Railway	Chainage	Height of bank	Description	R. ft. of water way	Earth work	Concrete	Masonry	Arch work and coping	Flooring	Girders in tons	Bed blocks	Wood work	Total cost
				Rate ..	... ...	Rs. 15 per 1,000 c.ft.	Rs. 26 per 100 c.ft.	Rs. 37 per 100 c.ft.	Rs 200per 100 c.ft.	Rs. 15 per 100 c.ft.	Rs. 300 per ton.	Rs.200per 100 c.ft.	Rs. 7 per c.ft.	.. ..
49	Heeragavaja-Veerana-	107,150	22·0	One girder 20 feet ..	20	24,825	3,708	16,522	·211	3,113	2·58	17·50	32·0	9,428
52	kanave Section.	111,150	23·0	One girder 20 feet ..	20	26,983	3,927	18,092	219	3,347	2·58	17·50	32·0	10,093
56		118,000	35·0	One arch 20 feet ..	20	57,716	5,922	30,838	3,854	4,318	..	..	..	22,173
60		122,150	15·0	Two girders 20 feet ..	40	14,116	2,744	9,384	172	2,942	5·16	35·0	64·0	7,248
61		123,550	33·0	One arch 12 feet ..	12	25,428	4,181	14,756	2,818	2,089	..	..	..	12,877
62		124,050	33·0	One arch 6 feet ..	6	10,662	26,651	6,058	1,457	876	..	..	..	12,376
				Total ..	118	..	..	..	..	..	..	..	..	74,195
				Add 5 per cent for contingencies ..	..	..	..	..	..	..	..	..	..	3,709
				Total ..	118	..	..	..	..	..	..	..	..	77,904
				Add cost of bridges less than Rs. 5,000 ..	112	..	..	..	..	..	..	..	..	37,463
				Total for Heeragavaja-Veeranakanave Section ..	230	..	..	..	..	..	..	..	..	1,15,367
				Rate per mile ..	..	..	..	..	..	..	..	..	..	14,791
				Add cost of bridges less than Rs. 5,000 ..	78	..	..	..	..	..	..	..	..	17,076
	Veeranakanave-Chikmagalur Section.			Total for Veeranakanave-Chikmagalur Section ..	78	..	..	..	..	..	..	..	..	17,076
				Rate per mile ..	..	..	..	..	..	..	..	..	..	4,367
				Grand total for whole line ..	698	..	..	..	..	..	..	..	..	2,15,259

Rate per mile — Rs. 7,469

III.—Formation.

(b) Minor Bridges costing less than Rs. 5,000.

Serial No.	Section of Railway	Chainage	Height of bank	Description	R. ft. of water way	Earthwork	Concrete	Masonry	Arch work and coping	Flooring	Girder in tons	Bed block	Wood work	Stone slabs 6″ thick	Stone slabs 9″ thick	Total cost
				Rate		Rs. 15 per 1,000 c.ft.	Rs. 26 per 100 c.ft.	Rs. 37 per 100 c.ft.	Rs. 200 per 100 c.ft.	Rs. 15 per 100 c.ft.	Rs. 300 per ton	Rs. 200 per 100 c.ft.	Rs. 7 per c.ft.	Rs. 0-12-0 per s.ft.	Re. 1 per s.ft.	
1	Kadur-Heeragavaja Section	200	1·5	One open top 2 feet	2	436	291	193	39	..	..	..	7·5	..	..	285
2		750	14·0	One flat top 4 feet	4	1,505	1,143	1,077	40	..	..	..	..	435	237	1,361
3		1,937	9·5	One girder 12 feet	12	6,047	1,355	3,672	115	647	1·32	15·00	20·00		..	2,695
4		3,340	2·0	One open top 2 feet	2	478	319	247	43		..	..	7·5			320
5		3,846	3·0	Do	2	562	375	387	51		..	..	7·5			403
6		6,400	4·0	Do	2	710	454	605	59		..	..	7·5			529
7		12,145	5·0	One girder 20 feet	20	3,493	903	1,834	75	353	2·58	17·50	32·0			2,192
8		14,724	7·0	Do	20	4,853	1,143	2,624	91	557	2·58	17·50	32·0			2,640
10		19,842	3·5	Two open top 2 feet	4	765	510	589	68			..	12·25			584
11		20,215	3·5	Do	4	765	510	589	68			..	12·25			584
12		22,055	3·5	Do	4	983	656	1,116	84	..		..	12·25	..	..	853
13		23,312	7·0	One flat top 4 feet	4	906	671	752	40	..	..	..	..	204	111	810
14		25,360	8·0	One girder 12 feet	12	4,550	1,103	2,677	99	454	1·32	15·0	20·0		..	2,177
15		27,400	7·0	One girder 20 feet	20	4,853	1,143	2,624	91	557	2·58	17·50	32·0			2,640
16		32,150	1·5	Two open top 2 feet	4	565	377	246	52	..	..	..	12·25			387
17		35,300	5·0	One open top 2 feet	2	806	538	844	67	..	..	..	7·50			651
18		38,000	5·0	One girder 20 feet	20	3,493	903	1,834	75	353	2·58	17·50	32·0			2,192
19		44,500	8·0	One girder 12 feet	12	4,550	1,103	2,677	99	454	1·32	15·00	20·0			2,177
21		52,990	6·0	Do	12	3,277	876	1,880	83	293	1·32	15·00	20·0	..	..	1,749
24		57,600	7·0	One flat top 4 feet	4	906	671	752	40			..		204	111	810
25		57,900	18·0	Do	4	1,847	1,413	1,263	40					567	319	1,686
26		59,980	18·0	Do	4	1,847	1,413	1,263	40					567	319	1,686
27		60,120	13·0	Do	4	1,419	1,075	1,030	40					401	219	1,282
28		62,300	7·0	Do	4	906	671	752	40					204	111	810
30		66,680	7·0	Do	4	906	671	752	40					204	111	810
31		67,700	5·0	One open top 2 feet	2	806	538	844	67				7·5	..	..	651
32		68,307	1·5	Do	2	436	291	193	39				7·5	..	..	285
33		68,675	8·0	One flat top 4 feet	4	992	738	798	40	..		..	..	237	129	889
34		73,400	4·0	One girder 12 feet	12	2,192	672	1,257	67	165	1·32	15·0	20·0			1,398
35		74,895	5·0	Do	12	2,711	771	1,548	75	225	1·32	15·0	20·0			1,564
36		81,440	6·0	One girder 20 feet	20	4,148	1,020	2,206	83	451	2·58	17·50	32·0			2,410
37		82,700	12·0	One arch 8 feet	8	4,956	1,243	3,266	517	600	..	..	..			2,729
38		85,400	5·0	One girder 20 feet	20	3,493	903	1,834	75	353	2·58	17·50	32·0			2,192
				Total	266	71,162	26,463	44,225	2,542	5,462	3·40	195	413·5	3,023	1,667	44,431
				Add 5 per cent for contingencies	..	..	..	..	..	..	..	..	..	..	..	2,222
				Total for Kadur-Heeragavaja Section	..	..	..	..	..	..	..	..	..	..	..	46,653

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IV. Bridges.

(b) *Minor Bridges costing less than Rs. 5,000.*—(contd.)

Serial No.	Section of Railway	Chainage	Height of bank	Description	R. ft. of water way	Earthwork	Concrete	Masonry	Arch work and coping	Flooring	Girders in tons	Bed block	Wood work	Stone Slabs 6" thick	Stone Slabs 9" thick	Total cost
				Rate ..	..	Rs. 15 per 1,000 c.ft.	Rs. 26 per 100 c.ft.	Rs. 37 per 100 c.ft.	Rs. 200 per 100 c.ft.	Rs. 15 per 100 c.ft.	Rs. 300 per ton	Rs. 200 per 100 c.ft.	Rs. 7 per c.ft.	As. 12 per sq.ft.	Re 1 per sq.ft.	
40	Heeragavaja-Veeranakanave Section	92,350	12·0	Two flat tops, 2 feet	4	1,864	1,547	1,255	50	..	..	..	..	604	402	1,879
41		95,800	8·0	One flat top, 4 feet	4	992	738	798	40	..	..	..	..	237	129	889
42		98,550	17·0	Two flat tops, 4 feet	8	2,661	2,117	1,591	50	..	..	..	..	873	582	2,517
43		100,550	8·0	One flat top, 4 feet	4	992	738	798	40	..	..	..	..	237	129	889
44		101,800	9·0	Do	4	1,077	806	845	40	..	..	..	..	270	147	968
45		103,650	20·0	One arch, 6 feet	6	6,842	1,753	3,979	872	588	..	..	..	..	..	3,863
46		104,850	3·0	Two open tops, 2 feet	4	691	461	470	64	..	..	..	12·25	..	..	518
47		105,450	2·0	One open top, 2 feet	2	478	319	247	43	..	..	..	7·5	..	..	320
48		106,550	4·0	Two open tops, 2 feet	4	839	560	708	72	..	..	..	12·25	..	..	651
50		108,550	5·0	Do	4	935	624	967	80	..	..	..	12·25	..	..	780
51		110,250	3·0	Do	4	691	461	470	64	..	..	..	12·25	..	..	518
53		111,600	7·0	Two flat tops, 4 feet	8	1,266	977	919	100	..	..	..	..	334	222	1,286
54		112,900	5·0	Two open tops, 2 feet	4	935	624	967	80	..	..	..	12·25	..	..	780
55		116,000	4·0	Two open tops, 2 feet	4	839	560	708	72	..	..	..	12·25	..	..	651
57		118,900	2·0	One open top, 2 feet	2	478	319	247	43	..	..	..	7·5	..	..	320
58		120,100	6·0	Two open tops, 2 feet	4	1,031	688	1,266	88	..	..	..	12·25	..	..	924
59		121,500	13·0	One flat top, 4 feet	4	1,419	1,075	1,030	40	..	..	..	..	401	219	1,282
63		125,000	11·0	Do	4	1,248	940	938	40	..	..	..	..	336	183	1,125
64		126,200	27·0	Do	4	2,616	2,020	1,682	40	..	..	..	..	864	471	2,385
65		126,700	25·0	Do	4	2,445	1,585	1,588	40	..	..	..	..	798	435	2,229
66		127,500	19·0	Do	4	1,932	1,481	1,310	40	..	..	..	..	600	327	1,756
67		127,900	22·0	Do	4	2,188	1,683	1,448	40	..	..	..	..	699	381	1,991
68		128,800	35·0	Do	4	3,300	2,560	2,054	40	..	..	..	..	1,128	615	3,016
69		129,210	2·00	One open top, 2 feet	2	478	319	147	43	..	..	..	7·50	..	..	320
70		129,800	16·00	Two flat tops, 4 feet	8	2,522	2,003	1,525	50	..	..	..	..	879	546	2,383
71		131,100	15·00	One flat top 4 feet	4	1,590	1,211	1,123	40	..	..	..	..	467	255	1,439
				Total ..	112	42,349	28,469	29,080	2,211	588	..	..	108·25	8,727	5,043	35,679
				Add 5 per cent for contingencies ..	..	..	..	..	..	..	..	..	..	..	..	1,784
				Total for Heeragavaja-Veeranakanave Section ..	..	..	..	..	..	..	..	..	..	..	..	37,463

Gauge 3'-3⅜" **KADUR-CHIKMAGALUR RAILWAY.** 28·82 Miles.

IV. Bridges.

(b) Minor Bridges costing less than Rs. 5,000—(contd.

Serial No.	Section of Railway	Chainage	Height of bank	Description	R. ft. of water way	Earthwork	Concrete	Masonry	Arch work and coping	Flooring	Girders in tons	Bed block	Wood work	Stone slabs 6" thick	Stone slab 9" thick	Total cost
				Rate ..	..	Rs. 15 per 1,000 c.ft.	Rs. 26 per 100 c.ft.	Rs. 37 per 100 c.ft.	Rs. 200 per 100 c.ft.	Rs. 15 per 100 c.ft.	Rs. 300 per ton	Rs. 200 per 100 c.ft.	Rs. 7 per c.ft.	Rs. 0-12-0 per sq.ft.	Re. 1 per sq.ft.	
72	Veeranakanave-Chikmagalur Section.	132,520	5·0	One open top, 2 feet	2	806	538	844	67				7·5	..		651
73		133,060	1·5	Four open tops, 2 feet	8	841	561	370	78				21·75	..		604
74		135,670	12·0	Two flat tops, 4 feet	8	1,864	1,547	1,255	50					604	402	1,878
75		138,420	14·0	One arch, 8 feet	8	5,740	1,419	3,741	653	664		..		..		3,246
76		140,720	14·0	One girder, 12 feet	12	9,928	1,930	6,351	147	1,128	1·32	15·0	20·0	..		4,030
77		142,520	6·0	Two girders, 12 feet	24	3,900	1,129	2,353	97	558	2·64	35·0	40·0	..	..	2,642
78		143,820	8·0	One flat top, 4 feet	4	992	738	798	40					237	129	889
79		144,120	9·0	Do	4	1,077	806	845	40					270	147	968
80		144,520	9·0	Do	4	1,077	806	845	40				..	270	147	968
82		149,770	1·5	Two open tops, 2 feet	4	565	377	246	52				12·25	..		387
				Total	78	26,790	9,851	17,648	1,264	2,350	3,96	50	101·50	1,381	825	16,263
				Add 5 per cent for contingencies												813
				Total for Veeranakanave-Chikmagalur Section	..											17,076
				Grand total for whole line	456											1,00,352

Gauge—3′-3⅜″ **KADUR-CHIKMAGALUR RAILWAY.** **28·82 Miles.**

V. Fencing, etc.

(a) *Fencing.*

Description	Unit	Rate	Whole line 28·82 miles		Kadur to Heeragavaja 17·11 miles		Heeragavaja to Veeranakanave 7·80 miles		Veeranakanave to Chikmagalur 3·91 mile	
			Quantity	Cost	Quantity.	Cost	Quantity	Cost	Quantity	Cost
		Rs.		Rs.		Rs.		Rs.		Rs.
Wire fencing round 1st class stations and yards and level crossings	Mile	3,000	2·89	8,670	2	6,000	...	...	89	2,670
Above fencing round stations of 3rd class	Mile	150	2·46	369	1·6	240	·86	129	...	...
Demarcation stones at 30 per mile	Each	1	864	864	513	513	234	234	117	117
Hedges and ditches along boundary.	Mile	50	57·64	2,882	34·22	1,711	15·6	780	7·82	391
Total ..		..		12,755		8,464		1,143		3,178
Add for contingencies at 5% ..		..		639		423		57		159
Grand total ..		..		13,424		8,887		1,200		3,337
Mean rate per mile Rs. ..		..		466		519		154		854

(b) *Road Crossings.*

1st Level crossing with gate and gate lodge.	Each	1,200	3	3,600	1	1,200	1	1,200	1	1,200
2nd Level crossing only with gate.	,,	250	3	750	3	750	..	..	..	...
3rd Level crossing with stone posts and chains.	,,	75	23	1,725	9	675	10	750	4	300
Total ..		..		6,075		2,625		1,950		1,500
Add for contingencies at 5% ..		..		304		131		98		75
Grand total ..		..		6,379		2,756		2,048		1,575
Mean rate per mile Rs. ..		..		221		161		263		402

(c) *Mile and Gradient Posts.*

Mile posts	Each	10	·29	290	17	170	8	80	4	40
Gradient posts	,,	8	113	904	45	360	50	400	18	144
Telegraph post number posts 24 per mile.	,,	2	691	1,382	410	820	·87	374	94	188
Tota l..		..		2,576		1,350		854		372
Add for contingencies at 5% ..		..		129		67		43		19
Grand total ..		..		2,705		1,417		897		391
Mean rate per mile		..		94		83		115		100

Gauge 3'-3⅜ | **KADUR-CHIKMAGALUR RAILWAY** | 28·82 Miles.

VII. Ballast and Permanent Way.

(a) Main Line. (i) Permanent Way and (ii) Ballast.

Description	Unit	Rate	Whole line 28·82 miles			Kadur to Heeragavaja 50 lbs. rails			Heeragavaja to Veeranakanave 60 lbs. rails			Veeranakanave to Chikmagalur 60 lbs. rails		
			Quantity	Cost	Rate per mile	Quantity	Cost	Rate per mile	Quantity	Cost	Rate per mile	Quantity	Cost	Rate per mile
		Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.
(a) Main line—														
(i) Permanent Way in main line	Mile ..	33,166	17·11	5,67,470	..	17·11	5,67,470	..	..	..	..	..	..	..
		40,237	11·71	4,71,175	..	..	..	..	7·80	3,13,848	..	3·91	1,57,327	..
Guard rails on sharp curves	..	25,571	1·8	46,028	..	..	..	..	1·80	46,028	..	..	..	..
Total	..		..	10,84,673	37,636	..	5,67,470	33,166	..	3,59,876	46,138	..	1,57,327	40,237
(ii) Ballast 10 c. ft. per foot run	Mile ..	2,633	28·82	75,883	..	17·11	45,051	..	7·80	20,537	..	3·91	10,295	..
Total	..		..	75,883	2,633	..	45,051	2,633	..	20,537	2,633	..	10,295	2,633
Total VII (a)	..		..	11,60,556	40,269	..	6,12,521	35,799	..	3,80,413	48,771	..	1,67,622	42,870
(b) Sidings. (i) Permanent Way and (ii) Ballast.														
(b) Sidings—														
(i) Permanent Way in sidings	Mile ..	33,166	1·908	63,281	..	1·908	63,281	..	..	..	..	..	..	..
		40,237	1·320	53,112	..	..	..	..	47	18,911	..	·85	34,201	..
Total	..	..	..	1,16,393	4,039	..	63,281	3,698	..	18,911	2,424	..	34,201	8,747
(ii) Ballast 8 c. ft. per foot run	Mile ..	2,106	3·228	6,798	..	1·908	4,018	..	47	990	..	·85	1,790	..
Total	..	..	..	6,798	236	..	4,018	235	..	990	127	..	1,790	457
Total VII (b)	..	..	..	1,23,191	4,275	..	67,299	3,933	..	19,901	2,551	..	35,991	9,204
(c) Points and Crossings.														
1 in 12	Set ..	600	8	4,800	..	4	2,400	..	2	1,200	..	2	1,200	..
1 in 8½	..	500	6	3,000	..	2	1,000	..	1	500	..	3	1,500	..
Total VII (c)	..	..	14	7,800	271	6	3,400	199	3	1,700	218	5	2,700	691
Grand total	..	..	..	12,91,547	44,815	..	6,83,220	39,931	..	4,02,014	51,540	..	2,06,313	52,765

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VII. Permanent Way.

Estimated cost of one mile of permanent way with 60 lbs. B. S. S. F. F. Rails.

Particulars	Weight in tons or quantity	Rate	Per	Cost
		Rs.		Rs
60 lbs. rails B. S. S. F. F.	94·29	150	Ton	14,144
Fish plates	4·02	180	,,	724
Fish bolts and nuts	0·93	1,600	,,	1,488
Screw spikes	3·19	1,200	,,	3,828
Dog spikes	1·93	1,200	,,	2,316
Loading and unloading at Sakchi and Kadur ..	104·36	1·25	,,	130
Carriage by rail from Kalamati to Kadur *via* Siri and Bombay, 1684, *i.e.*, (Kalamati to Siri 17 miles, Siri to Bombay 1,051 miles, Bombay to Kadur 616, total 1,684)-0—400 miles at 4·08 pies per ton per mile	104·36	8 8 0	,,	887
Do do 400 to 1,684, *i. e.*, 1,284 miles at 2·72 pies per ton per mile	104·36	18 3 0	,,	1,898
Unloading and transhiping into metre gauge at Poona	104·36	0 8 0	,,	52
Loading rails into material train	104·36	0 10 0	,,	65
Carriage of rails by train, average 14 miles ..	104·36	0 6 0	,,	39
Cost of sleepers, Mysore teak 1936 delivered at Kadur	1936	6 4 0	each	12,100
Bridge sleepers, 5 per mile ..	5	8 0 0	,,	40
Unloading sleepers into material train	70	0 10 0	,,	44
Loading sleepers into material train ..	70	0 4 0	,,	18
Carriage of sleepers by train, average length of 15 miles	70	0 6 0	,,	26
Laying charges		500	mile	500
Maintenance, during construction and 6 months after opening		600		600
Total ..				38,899
Contingencies at 5 per cent excluding cost of sleepers				1,338
Grand total				40,237

Gauge 3′—3⅜ KADUR-CHIKMAGALUR RAILWAY 28·82 Miles.

VII. Permanent Way.

Estimated cost of one mile of permanent way with 50 lbs. B. S. S. F. F. Rails.

Particulars	Weight in tons or quantity	Rate	Per	Cost
		Rs		Rs.
50 lbs. rails B. S. S. F. F	7·857	150 0	Ton	11,786
Fish plates	3·076	180 0		554
Fish bolts and nuts	0·485	1,600 0		776
Screw spikes	1·483	1,200 0		1,780
Dog spikes	1·219	1,200 0		1,463
Loading and unloading at Sakchi, and Kadur ...	84·833	1 0		85
Carriage by rail from Kalamati to Kadur, *via* Siri and Bombay, 1684, *i.e.*, (Kalamati to Siri, 17 miles, Siri to Bombay, 1051 miles, Bombay to Kadur 616, total 1684) 0—400 miles at 4·08 pies per ton per mile	84·833	8 8		721
Do do 400 to 1684, *i.e.*, 1284 miles at 2·72 pies per ton per mile ...	84·833	18 3		1,543
Unloading and transhiping into metre gauge at Poona	84·833	0 8		42
Loading rails into material train	83·833	0 10		53
Carriage of rails by train, average 14 miles ...	84·833	0 6		32
Cost of sleepers, Mysore teak, 1936, delivered at Kadur	1936	6 4	Each	12,100
Bridge sleepers, 5 per mile	5	8 0		40
Unloading sleepers into material train	70	0 10		44
Loading sleepers into material train ...	70	0 4		18
Carriage of sleepers by train, average length of 15 miles	70	0 6		26
Laying charges		500 0	Mile	500
Maintenance, during construction and 6 months after opening		600 0		600
Total				32,163
Contingencies at 5 per cent excluding cost of sleepers				1,003
Grand total				33,166

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Gauge 3'-3⅜ **KADUR-CHIKMAGALUR RAILWAY.** 28·82 Miles.

VII. Permanent Way.

Estimated cost of one mile Ballast.

Items	Rate	Per	Quantity Units	Cost
	Rs. a. p.			Rs.
(*a*) Ballast delivered at 10 c. ft. per foot run...	4 0 0	100 c. ft.	528	2,112
Putting the same on track	0 12 0		528	396
Total ...	...	...	...	2,508
Contingencies at 5 per cent	...	...	...	125
Total Ballast for main line per mile ...	...	...	...	2,633
(*b*) Sidings in yards—				
Ballast delivered in yard at 8 c. ft. per foot run	4 0 0	100 c. ft.	422·4	1,689
Putting the same on track	0 12 0		422·4	317
Total ..	...	....		2,006
Contingencies at 5 per cent	...	...		100
Total ballast for sidings per mile ...	...			2,106

VIII. Stations and Buildings.

(c) *Staff Quarters.*

Items.	Whole line 28·82 miles			Kadur-Heragavaja Section 17·11 miles			Heragavaja-Veerana-kanave Sectoin 7·80 miles	Veeranakanave-Chik-magalur Section 3·91 miles
	Cost excluding Junction	Cost of Junction	Cost including Junction	Kadur Junction	Brahma-samudra III Class	Sakrepatna	Heeragavaja III Class	Chikmagalur II Class
	Cost	Cost	Cost	Cost	Cost	Cost	Cost	Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Permanent Way Inspector	3 500		3,500			..	..	3,500
Assistant Permanent Way Inspector	2,600		2,600			2,600	..	..
Trollymen	3,000		3,000			1,500	..	1,500
Gang huts on line with wells	14,300		14,300		4,000	4,000	4,200	2,100
Rest house	8,000		8,000			..	..	8,000
Running room for Guards and Drivers	5,000		5,000			..	..	5,000
Station Master	11,300		11,300		2,600	2,600	2,600	3,500
Signallers, Clerks and Firemen, etc.	3,600	0,800	14,400	10,800			..	3.600
Guards		5,400	5,400	5,400			..	
Loco. Foreman		4,000	4,000	4,000			..	
Drivers		4,600	4,600	4,600	..		..	..
Traffic menials	7,000	2,000	9,000	2,000	1,500	1,500	1,500	2,500
Loco menials	..	7,500	7,500	7,500		..	..	
Police Sub-Inspector	..	2,600	2,600	2,600		..	..	
Police constables	2,800	1,200	4,000	1,200	600	600	600	1,000
Staff wells	2,000	500	2,500	500	500	500	500	500
Roads to Staff Quarters		1,000	1,000	1,000		..	..	..
Total	63,100	39,600	1,02,700	39,600	9,200	13,300	9,400	31,200
Contingencies at 5 per cent	3,155	1,980	5,135	1,980	460	665	470	1,560
				41,580	9,660	13,965		
Grand total	66,255	41,580	1,07,835		65,205		9,870	32,760
Rate per mile	2,299	1,443	3,742		3,811		1,278	8,380

VII. Stations and Buildings.

(*d*) *Station Machinery.*

Items	Whole line 28·82 miles			Kadur-Heeragavaja Section 17·11 miles			Heeragavaja-Veerana-kanave Section 7·80 miles	Veeranakanave-Chik-magalur Section 3·91 miles
	Cost excluding junction	Cost of junction	Cost including junction	Kadur junction	Brahma-samudra III Class	Sakrepatna	Heeragavaja III Class	Chikmagalur II Class
	Cost	Cost	Cost	Cost	Cost	Cost	Cost	Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Signals and interlocking	12,250	1,750	14,000	1,750	3,500	3,500	3,500	1,750
Buffer stops	300	150	450	150	50	50	50	150
Setoch block	100	60	160	60	20	20	20	40
Water columns	2,400	800	3,200	800	..	..	1,600	800
Loco. well 16' diameter	6,000	..	6,000	..	..	..	3,000	3,000
Piping	4,000	..	4,000	..	..	..	2,000	2,000
Steam pump with shed	2,400	..	2,400	..	..	..	1,200	1,200
Platform weighing machine	1,000	..	1,000	..	250	250	250	250
Goods weighing machine	600	..	600	..	..	300	..	300
Ash pit	3,900	1,300	5,200	1,300	..	..	2,600	1,300
Engine shed	..	10,000	10,000	10,000	..	..	..	..
Turn table	15,000	..	15,000	..	..	..	..	15,000
Weigh bridge..	5,000	..	5,000	..	..	..	..	5,000
Water tank and trestles	6,000	..	6,000	..	..	..	3,000	3,000
Total ..	58,950	14,060	73,010	14,060	3,820	4,120	17,220	33,790
Contingencies at 5 per cent ..	2,948	703	3,651	703	191	206	861	1,690
				14,763	4,011	4,326		
Grand total ..	61,898	14,763	76,661	23,100			18,081	35,480
Rate per mile ..	2,148	512	2,660	1,350			2,318	9,074

IX. Plant.

Sub-head	Description of sub-head	Rate per mile	Excluding Junction								Junction arrangement
			Whole line		Kadur-Heeragavaja Section		Heeragavaja-Veerana-kanave Section		Veeranakanave-Chik-magalur Section		
			Mile	Amount of sub-head	Mile	Amount of sub-head	Mile	Amount of sub-head	Mile	Amount of sub-head	
				Rs.		Rs.		Rs.		Rs.	
a	Engineering	150	28·82	4,323	17·11	2,567	7·80	1,170	3·91	586	
b	Construction	400	28·82	11,528	17·11	6,844	7·80	3,120	3·91	1,564	
c d	Locomotive and carriage and wagon	500	28·82	14,410	17·11	8,555	7·80	3,900	3·91	1,955	
e	Station and office furniture	120	28·82	3,459	17·11	2,053	7·80	936	3·91	470	
f	Steamers and boats										
g	Electric										
	Total			33,720		20,019		9,126		4,575	
	Rate per mile			1,170		1,170		1,170		1,170	

XI. Rolling Stock.

	Sub-heads	Rate per mile	Whole line 28·82 miles		Kadur-Heeragavaja Section 17·11 miles		Heeragavaja-Veerana-kanave Section 7·80 miles		Veeranakanave-Chikmagalur Section 3·91 miles		Remarks
			Unit	Cost	Unit	Cost	Unit	Cost	Unit	Cost	
		Rs.		Rs.		Rs.		Rs.		Rs.	
a	Locomotives	4,000	28·82	1,15,280	17·11	68,440	7·80	31,200	3·91	15,640	
b	Carriage and wagon	8,000	28:82	2,30,560	17·11	1,36,880	7·80	62,400	3·91	31.280	
c	Motors	Nil	..	..	..	..		..		..	
	Total	..	..	3,45,840	..	2,05,320	..	93,600	..	46,920	
	Rate per mile	..	..	12,000	..	12,000	..	12,000	..	12,000	

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Gauge 3'-3½"

KADUR-CHIKMAGALUR RAILWAY

28·82 Miles.

XII. Abstract of General charges.

	Items	Rate per mile	Whole line 28·92 miles		Kadur-Heeragavaja Section 17·11 miles		Heeragavaja-Veerana-kanave Section 7·80 miles		Veeranakanave-Chikmagalur Section 3·91 mile	
			Mile	Cost	Mile	Cost	Mile	Cost	Mile	Cost
		Rs.		Rs.		Rs.		Rs.		Rs.
a	Direction	1,369	28·82	39,456	17·11	23,424	7·80	10,679	3·91	5,353
b	Engineering	4,275	28·82	1,23,204	17·11	73,145	7·80	33,344	3·91	16,715
c	Stores	291	28·82	8,390	17·11	4,979	7·80	2,270	3·91	1,138
d	Audit and accounts	174	28·82	5,015	17·11	2,977	7·80	1,357	3·91	680
e	Medical and sanitation	243	28·82	7,000	17·11	4,158	7·80	1,896	3·91	950
f	Locomotive									
g	Traffic									
	Total ...	6,352		1,83,065		1,08,683		49,546		24,836

Gauge 3′—3$\frac{3}{8}$′ KADUR-CHIKMAGALUR RAILWAY. 28·82 Miles.

XII. General Charges.

Particulars	No.	Rate	Period months	Cost	Total
		Rs.		Rs.	Rs.
A. Direction—					39,456
Proportionate charges of Agent's and Superintending Engineer's Offices.	..	1,604	24	38,496	
Clerk in Superintending Engineer's office.	1	40	24	960	
B. Engineering—					1,23,204
Executive Engineer	1	600	24	14,400	
Assistant Engineer	2	300	24	14,400	
Upper subordinates	2	100	24	4,800	
Permanant way inspector ..	1	100	12	1,200	
Do sub-inspector ..	2	50	12	1,200	
Sub-overseers	9	50	24	10,800	
Maistries	12	30	24	8,640	
Accountant	1	100	24	2,400	
Assistant accountant	1	50	24	1,200	
Head clerk	1	60	24	1,440	
Cashier	1	60	24	1,440	
Assistant cashier	1	40	24	960	
Clerk of division office	4	35	24	3,300	
Clerk of sub-division office ..	2	30	24	1,440	
Draughtsman	1	50	24	1,200	
Tracer	1	30	24	720	
Peons for Executive Engineer ..	4	12	24	1,152	
Peons for others	10	10	24	2,400	
Sweepers	5	3	24	360	
Dark-runers	7	12	24	2,016	
Office accommodation	..	L.	S.	1,000	
Office furniture	..	L.	S.	1,036	
Travelling and Malnad allowances ..	..	1,000	24	24,000	
Quarters temporary. Rs.					
Executive Engineer 1×3,000=3,000					
Assistant Engineer 2×2,000=4,000					
Head clerk, accountant, cashier and draughtsman. 4×800=3,200					
Overseers 2×1,500=3,000					
Officials, Sub-overseers and others 15×500=7,500	..			20,700	
Unforeseen charges	..			1,000	
C. Stores—					8,390
Share of Chief Store Keeper's Establishment $\frac{1}{4}$ of the cost of Railway.	..	Appr		5,000	
Sub-store keeper	1	45	24	1,080	
Checker	1	20	24	480	
Peons	2	10	24	480	
Quarters and office building ..	..	L.	S.	1,000	
Office expenses	..	..	..	300	
Office furniture	..	..	..	50	
D. Audit and accountants—					5,015
Share of comptroller's Establishment.	..	Appr		5,015	
E. Medical and Sanitation—					7,000
Sub Assistant Surgeon	1	80	18	1,440	
Compounders	2	15	18	540	
Menials	2	10	18	360	
Travelling allowances	..	40	18	720	
Quarters and buildings	..	20	18	360	
Instruments	..	..		200	
Dispensery and office rent ..	..	..		1,000	
Furniture	..	..		200	
Office expenses	..	..		180	
Medicines	..	..		2,000	
Grand total ..	..	..	..	..	1,83,065
Rate per mile ..	..	..	..	..	6,352

Gauge 3'—3½"

KADUR-CHIKMAGALUR RAILWAY.

28·82 Miles.

Form R. I.—Curve Abstract.

Degree of curvature or radius	Whole line 28·82 miles			Kadur-Heeregavaja 0-17·11 Miles			Heeragavaja-Veeranakanave 17·11—24·91 Miles			Veeranakanave-Chikmagalur 24 91—28·82 Miles		
	Number of each	Total degree of curvature	Total length in miles	Number of each	Total degree of curvature	Total length in miles	Number of each	Total degree of curvature	Total length in miles	Number of each	Total degree of curvature	Total length in miles
10° (R-955·1 feet)	17	1,489·82	1·76	..	..	..	17	1,489·82	1·76	..	..	..
12° (R-479·5 feet)	1	43·50	·08	..	..	..	1	53·50	·08	..	..	..
8° (R-716·0 feet)	3	93 23	·19	..	..	..	3	93 23	·19	..	..	..
6° (R-955·0 feet)	2	114·00	·35	1	43·00	·12	..	..	..	1	74·00	·23
5° (R-1165·0 feet)	10	505·44	1·91	7	419 81	1·59	2	30 63	·11	1	55·00	·21
4° (R-1432·0 feet)	2	55·75	·26	1	35·75	·17	..	..	..	1	20·00	·09
3° (R-1910·0 feet)	13	362·42	2·29	11	331·42	2·09	..	..	..	2	31·00	·20
2° (R-2865·0 feet)	4	51·05	·49	2	37·76	·36	1	5·33	·05	1	8·00	·08
1° (R-5730 feet)	1	7·75	·15	1	7·75	·15	..	..	..	..	..	..
Flatter than 1° curve	1	2·77	·11	1	2·77	·11	..	..	..	..	..	..
Total ..	54	2,735·77	7·59	24	875·26	4·59	24	1,672·51	2·19	6	188·00	·81
Ratio of curve to total length of line ..	27 per cent			27 per cent			28 per cent			21 per cent		
Average amount of curvature per mile ..	97 degrees			7·5 degrees			214 degrees			48 degrees		

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Gauge, 3'—3½"

KADUR-CHIKMAGALUR RAILWAY.

28·82 Miles.

Form. R. II.—Gradient Abstract.

Gradient	Whole line 28·82 miles			Kadur-Heeragavaja mile 0 to mile 17·11			Heeragavaja-Veeranakanave mile 17·11 to mile 24·87			Veeranakanave-Chikmagalur mile 24·87 to mile 28·82		
	Number of each	Length in miles	Percentage of total length of line	Number of each	Length in miles	Percentage of total length of line	Number of each	Length in miles	Percentage of total length of line	Number of each	Length in miles	Percentage of total length of line
1 in 66·67 or 1·5 per cent	24	5·87	20·37	1	·72	4·21	22	4·70	60·25	1	·45	11·51
1 in 70·0 or 1·43 per cent	2	0·40	1·38	..	..	..	1	·13	1·67	1	·27	6·90
1 in 75·0 or 1·33 per cent	3	1·03	3·58	1	·88	5·14	2	·15	1·92	..	..	..
1 in 80·0 or 1·25 per cent	21	6·70	23·25	11	4·61	26·94	3	23	2·95	7	1·86	47·57
1 in 85·0 or 1·17 per cent	1	·06	·21	..	..	..	1	·06	·77	..		
1 in 87·0 or 1·15 per cent	1	·13	·45	..	..	..	1	·13	1·67	..		
1 in 90·0 or 1·11 per cent	1	·09	·31	..	..	..	1	·09	1·15	..	..	..
1 in 100·0 or 1·0 per cent	23	3·82	13·25	6	1·88	10·99	16	1·86	23·84	1	0·8	2·05
1 in 125·0 or 0·8 per cent	4	2·40	8·33	4	·40	14·03				..		
1 in 150·0 or 0·66 per cent	2	·40	1·39	2	·40	2·33				..		
1 in 200·0 or 0·5 per cent	4	1·13	3·92	2	·87	5·08				2	·26	6·65
1 in 220·0 or 0·454 per cent	1	·21	·73	1	·21	1·23				..		
1 in 250·0 or 0·40 per cent	2	·66	2·29	2	·66	3·86				..		
1 in 300·0 or 0·333 per cent	1	·62	2·15	1	·62	3·62				..		
1 in 500·0 or 0·20 per cent	3	·91	3·16	2	·53	3·10				1	·38	9·72
1 in 600·0 or 0·167 per cent	1	·34	1·18	..	..	..	1	·34	4·36	..		
1 in 1000·0 or 0·100 per cent	2	1·51	5·24	2	1·51	8·83	..	..	..	..	..	..
Level	18	2·54	8·81	10	1·82	10·64	1	·11	1·41	7	·61	15·60
Total	114	28·82	100·00	45	17·11	100·00	49	7·80	100·00	20	3·91	100·00

Gauge 3′—3½

KADUR-CHIKMAGALUR RAILWAY.

28·82 Miles.

Form R. III.—Bridge-Abstract.

Type of Bridge		Whole line 28·82 miles		Kadur to Heeragavaja mile 0 to mile 17·11		Heeragavaja to Veeranakanave mile 17·11 to mile 24·91		Veeranakanave to Chickmagalur mile 24·91 to mile 28·82	
Class	Span in feet	Total No. of spans	Water-way in feet	Total No. of spans	Water-way in feet	Total No. of spans	Water-way in feet	Total No. of spans	Water-way in feet
Open top drains	2	39	78	15	30	17	34	7	14
Flat top drains	4	33	132	9	36	19	76	5	20
	6	2	12	..	..	2	12	..	..
	8	2	16	1	8	..	..	1	8
Arched culverts	10	1	10	1	10	..	..	..	..
	12	1	12	..	..	1	12	..	..
	20	1	20	..	..	1	20	..	..
	12	11	132	8	96	..	..	3	36
	20	20	400	13	260	4	80	3	60
Girder bridges	30	1	30	1	30	..	..	..	..
	40	2	80	2	80	..	..	..	..
Total ..		113	922	50	550	44	234	19	138
Water-way ..	Major Bridges	220· Lin. feet		160 Lin. feet		... Lin. feet		60· Lin. feet	
	Minor Bridges	702· ,,		390 ,,		234 ,,		78· ,,	
Water-way per mile ..	Major Bridges	7 63 ,,		9·35 ,,		... ,,		15·34 ,,	
	Minor Bridges	24·36 ,,		22·79 ,,		30·0 ,,		19·95 ,,	
Total ..		31·99 ,,		32·14 ,,		30·0 ,,		35·29 ,,	

Gauge 3′-3⅜″

KADUR-CHIKMAGALUR RAILWAY.

28·82 Miles.

Form R. IV.—Important Bridges.

(Water way 1,200 square feet or more.

Name of River	Mileage	Drainage area	Discharge Dn. c.ft. per second	Assumed velocity in ft. per second	Required water-way in S. ft.	Proposed span		Remarks	Section of Railway
						Feet	Number		
Veda river ...	12·31	58	17,325	10	1,732	40	2	The water-way allowed is more than that of road bridge close by.	Kadur to Heeragavaja

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Gauge 3′—3⅜″ KADUR-CHIKMAGALUR RAILWAY. 28·82 Miles.

Form R. V.—Station Buildings.

Name of Station	Class	Mileage	Distance apart
Kadur junction W. E. G.	II		....
Brahmasamudra	III	7·37	7·37
Sakrepatna G.	III	11·25	3·88
Heeragavaja W.	III	17·29	6·04
Chikmagalur W.	II	28·63	11·34

W. denotes Watering Station.
E. ,, Engine shed provided.
G. ,, Goods arrangement provided.

Gauge 3′—3⅜″. KADUR-CHIKMAGALUR RAILWAY. 28·82 Miles.

Form. R. VI.—Station-machinery.

Name of Station	Signals		Buffer stops	Water column	Water tank	Well dia. 16 ft.	Steam pump with shed	Engine shed	Turn table	Station wash pit	Weigh bridge	Platform weighing machine	Goods weighing machine	Remarks
	Home	Outer												
Kadur junction		1	3	1				1		1	..	.	.	
Brahmasamudra		2	1							..	..	1	..	
Sakrepatna ..		2	1	..			..			..	...	1	1	
Heragavaja ..		2	1	2	1	1	1		..	2	..	1	.	
Chikmagalur ..		1	3	1	1	1	1		1	1	1	1	1	

APPENDIX I.

REPORT ON PROJECT ESTIMATE OF 1914

BY

MR. R. N. MIRZA, ASSISTANT ENGINEER

WITH REMARKS BY

MR. E. A. S. BELL, ENGINEER-IN-CHIEF.

Kadur-Chikmagalur Railway.

(METRE GAUGE, 3'—3⅜".)

REPORT.

1. PRELIMINARY.—The question of linking Kadur (Railway Station on the M. & S. M. Railway, 128 miles from Bangalore) and Chikmagalur was under consideration by the Government of Mysore as far back as 1893, and a preliminary reconnaissance survey was carried out by Mr. Groves. Since the question was in abeyance till the year 1912, when the Government decided to make a thorough investigation of a Railway route from Kadur to Chikmagalur. Before the survey was commenced, it was hoped that a ruling grade of 1 in 100 would be obtained throughout. From Kadur to Heeragavaja, a distance of 17·2 miles, this is quite possible, but between Chikmagalur and Heeragavaja, the Churché Guddh range intervenes, and the problem essentially consisted in overcoming these ghats by developing either the Dasarhalli or Hoskote Valleys. To reach Chikmagalur three passes were available—Hampapur, Veerannanakanve and Hoskote. After due consideration, it was decided to negotiate the alignment through Veerannanakanve (the present Government road goes through this pass) as Hampapur pass would mean a further rise of about 100 feet, while an alignment through the Hoskote pass (which is at a lower level than Veerannanakanve) would have necessitated a considerable detour to reach Chikmagalur. The real ghat work may be said to commence from Heeragavaja to Veerannanakanve.

2. From Kadur to Heeragavaja the rise is 400·16 feet, the distance between them being very nearly 17·2 miles, while the rise from Heeragavaja to the summit of Veerannanakanve is 550 feet (Heeragavaja to Veerannanakanve 7·2 miles and Veerannanakanve to Chikmagalur 3·45 miles). The first step was to develop the left-hand side of Dasarhalli Valley (facing north) by contouring with a grade of 1 in 120 in advance along the slopes, which work was then completed by a traverse party following in the wake of the contourer. It was necessary to contour at 1 in 120, so that after giving the necessary amount of compensation for curvature, the ruling gradient would work out about 1 in 100. On approaching Heeragavaja, however, it was found that this 1 in 100 grade would not work out.

3. On 3rd December 1912 a 1 in 50 traverse was commenced from Veerannanakanve towards Heeragavaja (*via* Lakya), this time developing the right-hand side of Dasarhalli Valley. After a thorough investigation it was found that this traverse gave a 1 in 43 ruling grade, and further that serious difficulties would be met with in negotiating an awkward spur about half a mile from Veerannanakanve.

4. On the 31st December 1912 a 1 in 50 traverse was commenced to once more develop the left-hand side of Dasarhalli Valley. This work was finished on the 19th January. This 1 in 50 alignment works out quite satisfactorily, but of course meant the use of a pusher engine from Heeragavaja up to Chikmagalur, if a line were to be constructed from Heeragavaja to Chikmagalur on that grade coupled with a 1 in 100 section between Heeragavaja and Kadur.

5. GRADIENT ADOPTED.—On March 14th, 1913, it was decided to re-grade once more the whole alignment from Kadur to Chikmagalur by the adoption of one ruling grade of 1½ per cent throughout. A party was sent out to the ghats to make another traverse, and this estimate has been framed for a ruling grade throughout of 1½ per cent. Taking into consideration all the investigations that have been made, it appears that this grade suits the nature of the country very well.

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6. GAUGE ADOPTED.—The gauge proposed for this line is of 3'—3⅜" (metre gauge) this is to facilitate transportation of materials by not breaking gauge at Kadur.

7. TOPOGRAPHY.—The nature of the country from Kadur to Chikmagalur is distinctly varied. From Kadur to Brahmasamudra (7·6 miles), the country may be termed plain, the soil being mostly black cotton soil, the alignment running more or less parallel to and between the Kadur-Chikmagalur Road and the River Veda. From Brahmasamudra to Sakrepatna a considerable amount of curvature is necessary owing to the plains being dotted here and there with big hills. There is plenty of cultivation in the vicinity in the shape of cocoanut and sugarcane plantations.

8. After crossing the River Veda, near Sakrepatna, the ground steadily rises till Gangahalla is crossed very close to milestone 143 (Kadur-Chikmagalur Government Road) and the alignment runs on the plains of Lakya. Passing Lakya the line enters into the Dasarhalli Valley and here the nature of the country is mountainous and rugged. Every effort is made to take advantage of the ruling grade as the line runs on the sides of the Churché Gudda Range. From Veerannanakanve to Chikmagalur the ground falls with undulations.

9. As the line connects two important taluks—Chikmagalur and Kadur—it may not be out of place to add here a few remarks on each of these taluks

10. KADUR TALUK.—Population in 1901 was 80,904. The taluk contains three towns—Birur, Kadur (head-quarters), and Sakrepatna and 317 villages. Total area 571 square miles. To the east lies the Garudangiri (3,680 feet) hill group and on the west a part of the Bababudan Mountain range (Sakunagiri, 4,653 feet). The River Vedavati runs through the middle towards north-east. The annual rainfall averages 22 inches. Most of the taluk is on a slightly undulating plain. Waste lands are covered either with babul or wild date trees, some large portions being reserved as grazing land.

Superior tobacco is grown in the south and west.

11. CHIKMAGALUR TALUK.—Area 638 square miles. Population in 1901 was 90,681. The taluk contains one town, Chikmagalur (population 9,515), the head-quarters, and 235 villages. To the north about 5 miles away are the lofty forest-covered Bababudan Mountains (highest peak Mulaingiri, 6,317 feet) enclosing the Jagar Valley. The form of this range is that of a crescent or a horse-shoe. The higher portions consist of steep grassy downs, well wooded in the ravines from which flow perennial streams. The sides are densely clothed with forest, among which are *numerous coffee plantations.*

12. The River Bhadra, flowing north, forms most of the western boundary. Annual rainfall averages 40 inches. Chikmagalur is surrounded by a plateau of rich black soil watered by perennial streams from the Bababudans, the principal one being the Yagachi, which flows south-east past Belur, Alur and Hassan. The ground is exceedingly fertile.

13. On the Bababudans are holy shrines which many pilgrims annully visit; this will certainly mean a source of considerable income to the railway. Besides, this shrine, Chikmagalur is noted for famous temples of Halebid and Belur where great holy fairs are held annually and which draw an enormous number of pilgrims from all parts of India.

14. AGRICULTURE.—The general agricultural crops grown in this part are paddy, ragi, sugarcane, gingelly, tagari, avari, garlic, onions, potatoes, jola, etc.

In addition to the above the following deserve special notice:—

The coffee cultivation of Southern India had its origin in this district (introduced in the 17th centutry). The coffee zone in this district is etimated to cover about 1,100 square miles. It is stated that cardamom grows plentifully in Kalasa and Melbangati Maganis. Two other important crops are coriander and arecanut, which are so universally used.

15. IRRIGATION.—Owing to scanty population, full advantage is by no means taken of the two big tanks—Ayankere and Maduk—near Sakrepatna. The introduction of a railway might help to change this.

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16. INDUSTRIAL ASPECT OF THE TRACT.—With regard to actual manufacture of goods and articles, the country is still in its infancy. Woollen blankets, cotton piecegoods and such articles, to supply only the immediate wants of the people, are made.

There are, however, possibilities; for not only is this district good for agriculture, but also for mining purposes. Iron ore is obtained and smelted along the hills east of the Bababudan Range. Corundum is also found.

17. COMMERCE AND TRADE.—The most important exports are coffee, pepper, cardamoms, rice and similar food grains. The rate of cartage is annas 4 per maund of 82·5 lbs. as charged by the out-agency to carry goods from Kadur to Chikmagalur and *vice versa*.

18. LOCATION.—The proposed railway forms a branch line connecting Chikmagalur (head-quarters of Kadur district) and Kadur, which is an important railway station on the main line between Poona and Bangalore.

19. The starting point is situated on the siding just opposite the south-east corner of the existing goods shed and is 245 feet distant from the centre line of the station building.

20. To start with, the alignment is a prolongation of the siding towards east for 424·5 feet, when it curves to the right till it approaches the Kadur-Mangalore Road near furlong stone $\frac{5}{132}$ the chainage being 12,000. From here it swings to the left, that is, away from the road to pass the villages of Chennapur and Kamsagar. Thence the alignment turns to the right till Ramanhalli village is reached.

21. Up to this the country allows of a flat gradient with very little bank and cutting, but from Ramanhalli, three-forths mile onwards, the maximum ruling grade of 1 in 66·6 is given, and thence up to Brahmasamudra the country is undulating and a grade of 1 in 80 is adopted.

22. Very close to Brahmasamudra it is proposed to locate a station. Brahmasamudra was once a very important place, and it is felt that a railway station there will soon bring the place into prominence. From Kadur to Brahmasamudra the distance is 7·55 miles, and the total rise 123·8 feet.

23. Between Brahmasamudra and Sakrepatna the country gradually rises admitting grades flatter than 1 in 100, the distance between the two places being 3·6 miles. Just before entering and just after leaving Sakrepatna the maximum grade has had to be introduced. The rise from Kadur to Sakrepatna is 198·0 feet.

24. The station for Sakrepatna is located within the fort and quite close to the village. This station will also serve 40 more villages. Sakrepatna, which is the most important station between Chickmagalur and Kadur, is sure to attract traffic.

25. A few words may be added here to state that plague has done an immense amount of damage to this once flourishing village. The old moat round the fort, which contains filthy and stagnant water, should be throughly drained and filled up, also a ditch in the fort grounds, in close proximity to the living quarters which appears to be an ideal breeding place for mosquitos and germs, owing to the dirty water in it.

26. After leaving Sakrepatna the line crosses the River Veda at chainage 65,000 (from Kadur) about 500 feet to the left of the existing road bridge. After crossing the Veda, the line runs (steadily rising) parallel to and between an elongated hill and the Kadur-Chikmagalur road, till Heeragavaja is reached, where a station is located. This station will also serve Devarhalli, Bommanhalli, Lakya, Hale Lakya, etc. From Sakrepatna to Heeragavaja the distance is 6·0 miles, and the total rise at Heeragavaja from Kadur is 400·16 feet.

27. The ghat portion of the alignment may be said to commence after leaving the plains of Heeragavaja and Lakya. From Heeragavaja the line takes a south-west direction alongside the villages of Davarhalli and Bommanhalli, and turns to cross the Kadur-Chikmagalur road at 4 furlongs 148 miles. Having

crossed the road it enters Dasarhalli Valley. Every attempt has been made to take full advantage of the ruling grade. The line runs along the right side of the valley looking towards Chikmagalur, the curves not exceeding 5° to pass on the right-hand side of the small village of Dasarhalli till the mouth of Hampapur gorge is reached. There is a small temple nearabouts here called Ranganatha Temple, which is visited by about 400 to 600 people annually. At Hampapur gorge the line takes a distinct turn towards south-east by a 12° curve loop to reach Veerannanakanve. The alignment now passes through deep cuttings and over high banks. Valleys and spurs alternate so closely that reverse curves of 12° have had to be used. At a distance of about 6,500 feet before Veerannanakanve is reached occurs a very awkward hillock knob and to negotiate this a 16° curve has had to be adopted.

28. Owing to the difficult nature of the country one 16° curve and several 12° curves have been adopted, but in final location it may be possible to flatten some of them.

29. The line swings through Veerannanakanve with a 6° curve crosses the present Government road to Chikmagalur twice within 500 feet distance; hence the road will have to be deviated to avoid unnecessary level-crossings

30. The distance from Heeragavaja to Veerannanakanve is 7·72 miles and the elevation of the pass above Kadur is about 950·0 feet.

31. From Veerannanakanve to Chikmagalur the distance is 3·45 miles, and the country rises and falls to make a net drop of 102·0 feet at Chikmagalur station yard.

32. Leaving Veerannanakanve the line runs in a direction heading a good deal away to the right of Chikmagalur. This has been done to avoid the low lands below the bund of Basavanhalli tank close to Chikmagalur, and also to locate the line on the upper side of the tank.

33. Passing the villages of Bikanhalli and Kempanhalli the line swings towards south, makes a loop round Basavanhalli, crosses the Kadur-Chikmagalur road near milestone 153, runs over the existing shandy or bazaar grounds and ends at 19,000 feet from Veerannanakanve. The station yard is located parallel to Santhepeta road (within 300 feet to the east of it).

34. The following two tables give useful summarised information :—

TABLE I.

	Miles.
Kadur to Brahmasamudra	7·55
Brahmasamudra to Sakrepatna	3·61
Sakrepatna to Heeragavaja ...	6·0
Heeragavaja to point A or Veerannanakanve	7·72
Veerannanakanve Pass to Chikmagalur	3·45
Total	28·33

TABLE II.

Place.	Levels.
Kadur	0
Brahmasamudra	123·8 feet higher than Kadur.
Sakrepatna	198·0
Heeragavaja	400·16
Veerannanakanve Point A	950·43
Chikmagalur	847·58

35. LABOUR.—There will be difficulties in obtaining labour for construction work in the district. Labour will have to be imported from outside. During the survey work, the field parties were continually troubled owing to the unwillingness on the part of the coolies to come to work. Those labouring people have small plots of land of their own, and they seem to be quite content to live on the little that the same yield. Further the physique of the working class is by no means good, and it is doubtful whether they would be of much use in hard and quick work.

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36. MATERIALS—*Lime.*—Good lime can be obtained at Halé Lakya, couple of miles away from Heeragavaja, also at Amble, 4 miles to the south of Chikmagalur towards Belūr.

Granite.—This can be obtained both at Kadur and Chikmagalur, but the Kadur granite is considered superior to that of Chikmagalur. The Kadur granite is quarried near a village called Haléshwar close by.

Sand.—For Kadur locality, the Veda River sand is generally used, and for Chikmagalur locality, the sand is brought from Mugalavalli about 6 or 7 miles away from Chikmagalur (Chikmagalur-Belur Government road)

R. N. MIRZA,

Assistant Engineer in charge of the Survey.

ENGINEER-IN-CHIEF'S REMARKS.

To get a good alignment for a railway into Chikmagalur is a matter of considerable difficulty, as this town is situated on a plateau at a considerable elevation above the valley of the Vedavati in which Kadur lies. There is a rise of about 500 feet in 2 miles between miles 148 and 150 (from Bangalore), and to negotiate this it was necessary to develop up a side valley which fortunately exists. These five or six miles of development are of the usual nature of a hill railway, and a large number of trial lines was run before the final alignment on a grade of 1½ per cent. was decided on

The centre line on which the estimates have been prepared in the ghat portion is a paper line based on a theodolite traverse and cross sections and has not been actually staked out on the ground. It is believed, however, that the quantities will prove to be fairly accurate. The location of this portion of the line reflects great credit on Mr. Mirza and his staff, all of whom were new to railway location work, and for work of this nature experience is of great assistance.

The alignment through the Veerannanakanve was selected so that a through line from Kadur *vid* Chikmagalur to Belur and Hassan could be located. Had the alignment through the Hoskote pass been adopted, it would have been necessary to approach Chikmagalur from the south or Belur side, and Chikmagalur must either have been on a branch, or else all through trains between Hassan and Kadur would have to go to Chikmagalur and reverse before proceeding onward.

But for this the Hoskote pass, which is rather more than 100 feet lower than the Veerannanakanve, would probably have presented a more favourable route for a railway. If the line from Hassan to Mangalore is built on the 2 feet 6 inch gauge, the portion from Chikmagalur to Alur should also be built on that gauge so as to avoid transhipment for coffee, and possibly minerals, from the Bababudan Hills in the one direction and manure and salt in the other direction, which will form the principal articles of exchange between Chikmagalur and Mangalore. On the other hand the line from Chikmagalur to Kadur should most certainly be metre gauge so that general bazaar produce, which is now imported and exported *vid* Kadur, can also be carried without break of gauge. If therefore, for any reason it is likely that Chikmagalur may become a terminus for a metre gauge branch line from Kadur, the Hoskote pass should certainly be investigated before construction is started on the Veerannanakanve ghat section, the first 17 miles being, however, common to both routes.

The estimate of cost has been carefully prepared, and the total will be sufficient to build and equip the line to the standard provided for therein.

Traffic Prospects.—The Madras and Southern Mahratta Railway have an out-agency at Chikmagalur, but the returns for the last two years show that it is but little patronized, and it is evident that merchants prefer to cart their goods to and from Kadur. Based on Palmer's formula the traffic earnings may be estimated as follows:—

		Rs.
Town Earnings—		
Kadur,	2,900 × 2	5,800
Chikmagalur,	8,537 × 2	17,074
Rural Earnings—		
10 × 13 × 148		19,240
10 × 15 × 128		19,200
	Total	61,314
	Deduct working expenses at 60 per cent	36,788
	Net earnings	24,526

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which represents a return of only 1½ per cent. on the capital cost. The return is a poor one, but the line will open up this part of the country and bring more traffic to the main line. The estimated gross earnings correspond to an average of Rs. 42 per mile per week, which compares with 34 and 21 in the case of the Birur-Shimoga and Mysore-Nanjangud lines respectively during the first year after opening, so it would be unwise to expect a higher return at first. Six years after opening, the earnings on the Birur-Shimoga and Mysore-Nanjangud lines were 56 and 42 per mile per week respectively, and similar development may be expected on this line also.

BANGALORE,
10th March 1921.

E. A. S. BELL,
Engineer-in-Chief,
State Railway Construction.

APPENDIX II.

EXTRACTS FROM CORRESPONDENCE CONCERNING THIS PROJECT.

APPENDIX II (*a*).

Extracts from note dated 6th November 1914 *by Mr. E. A. S. Bell, Secretary for Railways.*

* * * *

2. I presume the intention is to make a more or less direct line from Chikmagalur *via* Linganhalli to Birur and not merely an addition to the present project of a line 4 miles long between Kadur and Birur parallel to the existing line of Railway. If the former view is correct, this means the preparation of an independent project and the shelving of the Chikmagalur-Kadur project entirely.

3. Then again as regards the direct route, Linganhalli would be an obligatory point; but beyond that place two alternative routes are possible. One direct to Birur along the valley of the Veda to near Ayyankere, thence across the watershed between the valleys of the Veda and Avati to near Madagadakere whence the valley of the Avati would be followed to Birur. This would be about 32 miles long and between Linganhalli and Birur would run through almost uninhabited country. The second route would follow the road to Santaveri, thence *via* Lingadhalli to Birur and would probably be 50 miles long, allowing for the developments down the ghat between miles 14 and 16 on the road and between miles 20 and 24.

4. To begin with, a tunnel which may be a half mile long and cost Rs. 8 to 10 lakhs will be necessary between miles 4 and 5 of the Santaveri Road and there will probably be at least a mile on each side of very heavy work in order to gain height and so limit the length of the tunnel. This is before Linganhalli is reached and therefore common to both routes. In the Veda valley very heavy work is also certain, and a tunnel may be found necessary in the watershed between the Veda and Avati valleys. On the other route a tunnel, which will certainly be 1 mile long and may be 2, will be necessary under the Santaveri ridge at a cost of something between 20 and 40 lakhs of rupees. The summit at Santaveri is 4,000′ and assuming we tunnel at 3,500 there will still be a drop of 900 (in 3 road miles) to negotiate on the north face and at 75 feet per mile this will mean 12 miles of development in very difficult country. The direct line to Birur *via* Santaveri is not therefore likely to cost less than 80 to 100 lakhs of rupees.

5. There will be no difficulty about the Hassan-Chikmagalur section which can be revised in office without any further survey.

I beg also to enquire if it is the desire of Government that I should take up the preparation of the revised Hassan-Birur project at once.

APPENDIX II (*b*).

Letter No. 12633, *dated* 22*nd*—23*rd December* 1915, *from Mr. C. Dove Wilson, Engineer-in-Chief, Mysore State Railway Construction Department, Bangalore, to the Secretary for Railways.*

BIRUR-CHIKMAGALUR RAILWAY SURVEY.

In reply to your letter No. 1564, dated 7th December 1915, I have the honor to inform you that from a perusal of the report and drawings of the Kadur-Chikmagalur Railway Survey and from the information given on the topo maps it is clear that difficult country must be negotiated between Birur and Chikmagalur. The approach to Chikmagalur from the north would involve a long tunnel and very heavy work practically the whole way from Birur and is outside

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practical politics. The only practical alignment appears to be the one selected from Kadur as there would be no difficulty in making a line on 1 in 100 from Birur to Brahmasamudra at mile 7½ on that alignment and it would add only about 2 miles to the length. The alignment selected by Mr. Bell has the disadvantage that the range of hills to the east of Chikmagalur is approached by a long length of continuous grade of 1 in 66·67. This heavy gradient would seriously affect through traffic as it would require a banking engine if loads for the 1 in 100 ruling grade are to be taken without the trains being split up. Again if only one engine is used heavy ghat brakes which carry no paying load would have to be attached to the rear of the train to prevent accidents in case of breakways. Mr. Bell says that the Hoskote pass is about 100 ft. lower than the one he selected and that he did not investigate it in detail as it causes the approach to Chikmagalur to be from the south-east and would require either a branch line or an objectionable deviation of about 5 miles in the wrong direction to Chikmagalur if the line is carried on to Hassan. It is more than doubtful if a grade of 1 in 100 can be obtained at anything like reasonable cost. Even if a 30 ft. cutting is made at the top of the Hoskote Pass there is a fall of 644 ft. requiring a development of 14½ miles of falling grade to work out the grade of 1 in 100 allowing for compensation on curves, and judging by the map this cannot be done without considerably adding to the length of the line. The work will be heavy as the cost will not be below Rs 75,000 a mile. Owing to the grades heavy engines must be used and the standard would have to be the same as on the Mysore-Arsikere Line.

The Hoskote pass is worth investigating but this will take some time as trial lines must be run. A mere reconnaissance survey will not give sufficiently accurate results to enable a decision to be arrived at as to the best gradient obtainable. I understand that this has already been investigated by Mr. Groves and I shall be obliged if you can send me any information there may be available about this survey.

APPENDIX II (*c*).

Note by Mr. K. Krishna Iyengar, Offg. Secretary for Railways. dated the 29th May 1916.

Subject:—Reconnaissance survey for a line of Railway from Chikmagalur to Birur.

With reference to Dewan's orders on this office Note No. 239, dated the 6th November 1914 on the above subject, I beg to report for the information of Government that as the Survey of the Chikmagalur-Birur Line does not find a place in the programme for the next year sanctioned in Government Order No. 3183-7—Ry. F. 42-15-16, dated the 20th May 1916, the investigation of the line will be held in abeyance for the present.

APPENDIX II (*d*).

Extract from a note dated 12th September 1917. by Mr. D. G. Dani. Acting Secretary for Railways.

As the line is not included in the sanctioned triennial programme and as staff to carry out the necessary investigation will not be available for some time longer, the question of connecting Chikmagalur with Birur has not yet been investigated to decide whether Birur or Kadur is a better place for connection with the main line. Mr. Dove Wilson has put up a clear note on the subject, copy herewith attached, and I generally agree with him in his remarks as under:—

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The approach to Chikmagalur from the north would involve a long tunnel and heavy work practically the whole way from Birur and is outside practical politics."

2. Mr. Rice, Superintending Engineer for surveys, was also consulted in this matter and his views are also attached.

3. In connecting Chikmagalur either with Kadur or Birur very difficult country has to be negotiated and the expected return for the heavy capital outlay necessary, is very poor. For a metre gauge line to Kadur the estimate of 1914 gives it, as only 1½ per cent and this will further be lowered when we take into consideration the raised capital cost owing to a revision of the estimate necessary on account of changes in rates for railway material due to the war. In fact this connection if decided on, will be a repetition of the construction of the Hassan-Arsikere Section of 29 miles, with all its costly ghat work and therefore two expensive ghat lines running almost parallel to reach other at a distance of about 25 to 30 miles should certainly be avoided till an economical connection cannot be secured for Chikmagalur.

4. Chikmagalur, however, must be connected with a line of railway very early and the connection to Chikmagalur should be investigated, if practicable from Hole-Narsipur-Mudgere-Tirthahalli-Arasalu line, about which orders have been sought in my No. 131, dated 27th/28th August 1917.

5. A convenient point for this connection could be selected along with a preliminary investigation of the above mentioned Hole-Narsipur-Tirthahalli-Arasalu line, as then the connection to Chikmagalur will form a part of the higher plateau line, and heavy ghat work can then be avoided. Mr. Rice suggests in the concluding lines of his note that the Birur or Kadur-Chikmagalur line could be extended to Mudgere or to Saklespur *via* Belur, but I am for investigating his future extension at this stage, *i.e.*, investigating a connection from any convenient point between Saklespur and Mudgere to Chikmagalur.

6. We will thus have Mysore-Hole-Narsipur-Saklespur-Tirthahalli-Arasalu as our high plateau line and Harihar-Kadur-Arsikere-Tumkur as the approximately parallel low plateau line, both being connected with each other by the Saklespur-Hassan-Arsikere link when the Saklespur-Hassan connection is made. In this arrangement each section will develop a new country and will not infringe on the sphere of influence of the other.

7. In conclusion orders are requested—

(*a*) On my note No. 131, dated 27th/20th August 1917.

(*b*) and along with the line proposed therein to investigate a suitable connection for Chikmagalur from any convenient point between Saklespur and Mudgere on the Hole-Narsipur-Saklespur-Tirthahalli and Arasalu high plateau line.

(*c*) till the results of this investigation are known the future investigations for Birur or Kadur-Chikmagalur project may be held in abeyance.

APPENDIX II (*e*).

A short note dated 7th March 1918 on Kadur-Chikmagalur and Hassan Railway project by Mr. D. G. Dani, Acting Secretary for Railways.

In 1900 the Deputy Commissioner of Kadur, brought to notice the desirability of constructing a line of Railway from Kadur to Chikmagalur and he was informed that the question of the proposed railway could not be taken up for some years longer.

2. An estimate was sanctioned in 1912 for surveying a line of Railway from Hole-Narsipur to Kadur *via* Chennarayapatna, Hassan and Chikmagalur. In April 1914, projects were submitted to Government for—

(i) a metre gauge railway, 28 miles long and estimated to cost Rs. 16,59,330 from Kadur to Chikmagalur and

(ii) a 2'-6" gauge railway. 37 miles long and estimated to cost Rs. 17.48.125 from Chikmagalur to Hassan.

3. Government ordered in November 1914 that the second project should be revised for a metre gauge line and Birur should be connected instead of Kadur. The enormous cost involved in connecting Birur was then represented to Government and final orders sought

4. Government ordered in December 1915 that a reconnaissance survey for a most favourable alignment from Chikmagalur to Birur may be taken up. The project was then, with permission held in abeyance as it had not been included in the sanctioned survey programme

5. The investigation of Birur or Kadur-Chikmagalur line has now been ordered to be taken up during this official year.

APPENDIX II (1).

Copy of letter dated 4/6 May 1918 from Mr. D. G. Dant, Agent, Mysore Railways.

METRE GAGUE RAILWAY. CONNECTION TO CHIKMAGALUR.

The detailed investigation of a line of Railway from Kadur or Birur to Chikmagalur was sanctioned in G. O. No. R. S. 2945-50/Ry. F, G. 42-17-18, dated 30th March 1918. An estimate amounting to Rs. 7,949 for the above survey is herewith submitted to Secretariat Branch for obtaining and communicating sanction of Government thereto

The line surveyed in 1914 followed the road generally with a ruling gradient of 1½ per cent. Now it is proposed to survey a line of Railway with 1 per cent ruling gradient and serving the largest tract possible. The proposed alignment will start from Chikmagalur and touches, Karagada, Kalaspur, Kanvehalli, Sadarahalli, Kunnel, Sakrepatna, Brahmasamudra and connect with the main railway line at a new station somewhere near Kadur, *vide* sketch enclosed. For the first project, the range of hills outside Chikmagalur is crossed at Veerannanakanve pass at an elevation of 3,444 feet above M. S. L. Kanvehalli pass now proposed to be crossed, seems to be a little more than 3,000 feet and certainly much lower than the pass negotiated in the first survey. It is unnecessary to run a separate line to Birur and the proposed junction will save the construction of 4½ miles of Railway. As we have acquired running powers on Arsikere-Birur section, Birur will be the engine changing and terminal station for this branch line. The length of the proposed line is apprximately 34 miles and though this is a little longer than the original survey, it is recommended for adoption as the line runs within 6 miles distance for Belur and Halsbid to which a road may be made and the distance for the future Mudigere connection will be considerably reduced.

The Secretariat Branch is requested to kindly obtain and communicate sanction of Government to the enclosed estimate amounting to Rs. 7,949 for investigating in detail a line of Railway from Chikmagalur to Birur on the above route.

Rs. 3,000 which was alloted for Chikmagalur-Koppa Survey by reappropriation will be utilised during this year for this survey, and the Superintending Engineer for Surveys has been asked to take up the Chikmagalur-Mudigere Survey after this survey is finished

APPENDIX III.

TRAFFIC REPORT ON KADUR CHIKMAGALUR RAILWAY

BY

MR. K. RAGHAVACHAR, TRAFFIC INSPECTOR,

(Referred to in Mr. Rice's Report as Appendix B.)

MYSORE STATE RAILWAYS.

Kadur-Chikmagalur Railways.

TRAFFIC REPORT BY MR. K. RAGHAVACHAR, TRAFFIC INSPECTOR.

Previous survey in 1914 for Metre Gauge — Miles 28·33
Proposed alignment Birur to Chikmagalur 2 ft. gauge — ,, 30

The Kadur-Chikmagalur Project reported on by Mr. E. A. S. Bell gives the shartest connection from Kadur to Chikmagalur, the Head Quarters of the Kadur District, by a Railway line 28¾ miles long but the construction of it along the Bababudan Hills is not only unduly costly but also the train load would have to be restricted due to heavy gradients. This and the limited traffic in view would hardly justify the heavy outlay needed for a metre gauge.

The projected line passes through the Hoblis of Birur, Kadur, Sakrepatna, Chikmagalur and Mirla of Kadur and Chikmaglur Taluks which hold cultivated areas of 103,874 and 32,287 acres and population of 44,227 and 42,370 respectively. Nearly half the cultivated area is now lying barren and after the Railway is opened, there may, in due course, be an increase in the field crops.

The commodities exported are paddy 300 tons, ragi 250, jola 750, cereals 2,500, horse gram 500, coriander 200, oil seeds 150, arecanuts 210, coffee 1,120, cocoanuts No. 120,000, cardamoms 117 tons, pepper 4, jaggery 250, tanning bark 50 timber 600, sandal wood 410, soapnuts 1,000, and hides and skins No. 1,800.

The goods imported are salt 415 tons, kerosene oil 74, ghee 1,650, vegetable oils 100, sugar 250, rice 150, jaggery 1,250, Bengal gram 1,600, cocoanuts 66, G. goods 5,000, ragi 220.

Paddy, coffee and jaggery are despatched to Mangalore by carts but about 700 tons coffee are sent from Birur to Mangalore by rail and sea *via* Marmugao.

The M. & S. M. Railway have opened an out agency at Chikmagalur and the booking of goods there for the last year is—

Outwards Chikmagalur out-agency to Kadur	..	7,901 Mds.
Inwards Kadur to Chikmagalur out-agency ..	..	5,301 ,,
Total Mds.	..	13,202 or 489 tons.

A considerable quantity of the goods from and to Kadur go by carts to Chikmagalur.

The traffic dealt with at Kadur Railway Station for the latest year is—

Passengers		No. 62,677	
Goods.	Coffee	3,245	Maunds.
	Food grains	10,161	,,
	Salt	16,841	,,
	Timber	12,411	,,
	Sandalwood	3,465	,,
	G. Goods	51,087	,,
	Stones	28,176	,,
	Fish manure	727	,,
	Hides	4,962	,,
	Total ..	1,31,075	Maunds or 4,855 tons

Enquiries shew that about four-fifths of the coaching and nine-tenths of the goods come from the sphere influenced by the proposed Branch line. Toddy is exported to Chikmagalur from Kadur daily in 4 carts.

The following shandies contributed traffic :—

Kadur	Monday	Rice.
Sakrepatna	Tuesday	Rice, ragi, jaggery.
Pura	Wednesday	Do
Chikmagalur	,,	Do

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Belur	Thursday	Rice and pulses.
Devanur		Do
Arsikere	Friday	Do other food grains.
Keresanate	Saturday	Rice, pulses, other food grains, cocoanuts.
Birur		do
Banavar	Sunday	do

The jatras named below attract passengers and goods annually :—

	Gathering people
Sakuni Ranganathaswamy in Pushya	20,000
Antergatta Durgamma in Magh	10,000
Yegatipura Mallikarjuna	4,000
Darga in Bababudan Hill	3,000
Nirvanaswamy Matt	2,000

It may not be out of place to mention here that there are tanks unrestored as under :—

	Major	Minor
Chickmagalur Taluk	10	436
Kadur Taluk		93

There is a tannery at Kadur on a capital of Rs. 10,000 but facilities are wanting to make it pay.

Since it is not contemplated to open a Railway line to Mangalore or Hassan from Chikmagalur, there seems no real need to construct a bigger gauge than of 2 feet. The small size timber and the local produce considerably limited to other than the monsoon weather can reasonably be expected to be carried in small type wagons subjected to transhipment at the junction.

The average number of M. & S. M. Railway wagons dealt with daily during the traffic season has not been more than 8 and presuming that 2 small wagons carry the load of one, it would give 16 loads or 8 each way. These with 3 or 4 coaches and a Brake would form the load for each one of the up and down trains daily. Of course whenever sufficient traffic offers, extra goods train may be put on.

The estimated earning will be :—

Metre gauge

No. of passengers	86.580	
Coaching earnings		Rs. 31,052
Goods tons	7,695	
Goods freight		Rs. 32,571
Total earnings ..		Rs. 63.623
Train miles	21,790	
Working expenses at Rs. 1·65 per train mile		Rs. 38,222
Net. earnings		Rs. 25,401
Capital including junction expenses		16,60,000
Percentage		Rs. 1·53

2 feet gauge

Traffic earnings are the same, as also the train miles.

Total earnings	Rs. 63,623
Working expenses at 60 per cent	Rs. 38.174
Net. earnings	Rs. 25,449
Capital outlay including junction expenses	Rs. 10 lakhs.
Percentage	Rs. 2·54

For the mere idea of preventing the break of bulk of goods which is limited a heavy investment to build and equip a metre guage cannot be economical.

It need not be expressed here that our farmers without taking the least precaution to keep some reserve stock or, to wait for favourable rates despatch away their produce and suffer bitterly at the end. There may be for this reason a heavy rush in the harvest time, but to soon ebb down in a couple of months.

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Such an influx may seem to demand a metre gauge equipment but from an economic point of view it cannot but be a profitless sacrifice to the ryot to part with his produce cheaply when the same can keep and command better price later. The State on the other hand having done to its ryots the favour by not imposing cart toll and income taxes, ought not to do a dis-service to them by helping them to drain away through the costly metre gauge for the least profit to themselves and all advantage to the outside speculators.

Again when the gauge is similar to that of the neighbouring lines and stock is agreed to be exchanged, there is the risk of undue wear and tear as well as detention to stock when sorely, the same is needed on the branch and due to less import than export, other wagons don't offer. When the gauge of a branch line the traffic of which is limited is different from the main line its stock would be left to its local use and depreciation to the same would be decidedly normal. The cost of handling at the transhipping junction and the detention thereby caused cannot prevent or divert the goods since there is evidence of the consignments going over to the sea after bearing all the incidental expenses and commission at 3 or 4 stages.

If however for any other reason a metre gauge is to be adopted scope must be found to make the line pay as the sphere created by this project is certainly too small judging from the produce, and the likely export if the line be located between Banavar Railway Station and Chikmagalur passing through Jangal, Halebid, Belur and Magadi, it would simplify the traffic resources, to sustain a metre gauge. This line would be about 43 miles running clear of hills and valleys.

The next question at issue is whether Birur cannot conveniently be connected with the projected line. Enquiries show that the Birur junction can be made the starting station instead of Kadur by laying the line over Linglapur and linking it with the Kadur-Brahmasamudra alignment at Chikingla which gives a distance of about 5 miles. This will increase the length of the projected line to 29½ miles. As the Birur merchants with the help of those at Chikmagalur conduct the trade, the starting of the line from their residence would help to concentrate business and develop traffic better. As there is more traffic towards Bangalore extra freight Birur to Kadur 4 miles would be earned, while on the traffic to and from Poona side trainage for a mile more is secured.

The climate of Birur is free from malaria unlike Kadur.

For the junction arrangements at Birur a third rail has only to be provided to the sidings; a transhipping platform and a few more quarters for the staff will suffice.

The additional length Birur to Chikmagalur has nothing of traffic to add from the few villages nor the omission of Kadur for junction to diminish it. The estimate given above for the Kadur-Chikmagalur length will stand for the Birur-Chikmagalur section, either for the metre gauge or for the smaller gauge. As already mentioned in the traffic report, the estimate of revenue includes the contribution from the Belur Taluk and the change in the alignment making it pass through a portion of the above said taluk does not require any change.

K. RAGHAVACHAR,

28th February 1918.

Traffic Inspector, M. S. Railways,
on Survey duty.

WD 894—GBPM—100—1-8-21.

Kadur-Chikmagalur Railway.

PROJECT OF 1918-19.

REPORT BY H. D. RICE, SUPERINTENDING ENGINEER, MYSORE RAILWAY SURVEYS, WITH A NOTE ON RATES.

I. HISTORY AND GEOGRAPHY.

History.

1. The question of a branch Railway from Kadur to Chikmagalur apparently discussed as far back as 1893 when Mr. H. Groves carried ou preliminary reconnaissance survey. It was again opened in 1912 when Government sanctioned a detailed survey. This was done by Mr. R. N. Mirza, Assistant Engineer under the orders of the then Engineer-in-Chief Mr. E. A. S. Bell. The project was submitted to Government in March 1914. In January 1918 when the construction of this line was being discussed it was considered advisable to revise the estimate as a portion of it had been based on a paper location and rates had increased since the estimate was prepared. After examining the alignment the present writer reported that a better one was possible and suggested a fresh survey. The question of using Birur as the junction instead of Kadur was also again reopened, and it was eventually decided by the Agent to have a fresh survey altogether along the alignment. I had proposed, connecting the Railway at Kadurhalli—2 miles on the Bangalore side of Kadur, which would save 5 miles of construction at no sacrifice of traffic. A Traffic Inspector was at once sent out to prepare a traffic estimate. The detailed survey was started in April and completed in November 1918 by Overseer Mr. H. Sambiah under my orders.

2. The detailed survey of 1914 followed the road and crossed the Chunchegudda Range of Hills at the same pass as the road, *viz.*, the Veerana Kanave at an elevation of 3,444 having risen 550 feet in 7 miles. The ruling gradient adopted on this line was 1·5 per cent (1 in 66·66) uncompensated, which is equivalent to 2 per cent when combined with a 16° curve. The distance from Kadur to Chikmagalur was 28·33 miles. In the report accompanying this project references were made to the Hoskote pass which is 2 miles south of the Veerana Kanave and 100 feet lower. It is said that this lower pass was not used because a line passing through it would approach Chikmagalur from the south instead of from the north which was considered more suitable as it was then under contemplation to extend the line due south to Belur and on to Hassan. The Engineer-in-Chief in this connection stated that an alignment through the Hoskote pass should certainly be investigated if Chikmagalur was likely to be the terminus of a metre gauge branch from Kadur.

3. It may be mentioned here that since 1914 the whole Railway programme has been changed. I believe the proposal to run a line from Chikmagalur to Hassan *via* Belur has now been entirely dropped as it does not tap the Malnad sufficiently but only runs along the fringe of it. Instead of this a line which I have called the "Malnad Railway" running from Hole-Narasipur on the Myore-Arsikere Railway to Arasalu on the Shimoga-Bhatkal Railway *via* Saklespur, Mudgere, Sulebail, Hariharpur and Tirthahalli and following the Hemavathi, Bhadra, Tunga and Kumadvati Valleys seems to find favour, and there is a local demand also to connect Chikmagalur when the Railway reaches it with Mudgere.

4. The alignment suggested by me and referred to in para 1 passes through the Kanavehalli Pass which is 6 miles south of the Veerana Kanave and at an elevation of 3,044 feet that is to say 400 feet lower. It then undulates across rough

country to Karagada where it joins the proposed alignment of the Railway connecting Chikmagalur with Hassan referred to in para 2. The distance from Kadurhalli to Chikmagalur by this route is 38·73 miles. The ruling gradient is 1 per cent (1 in 100) compensated. It passes within 4 miles of Belur, 5 miles of Halibid and 5 miles of Belvadi all places of local importance and furnishing more traffic than the former route. It reduces the length of new construction if a line to Mudgere is decided upon. The lengths of construction compare as follows :—

By former route.	
Birur to Chikmagalur (with small capacity)	31 miles.
Chikmagalur to Mudgere	30½ miles.
Total	61½ miles.
By route now proposed.	
Kadurhalli to Chikmagalur (with big capacity and better traffic)	38·73 miles.
Karagada to Mudgere	22·75 miles.
Total	61½ miles.

The total length is therefore seen to be identical but there is no doubt that the latter is the correct route from a Railway point of view. Karagada will be the Junction Station from Mudgere on the Kadurhalli-Chikmagalur Branch—the line to Mudgere running up the Kudlur Valley as far as Chatanhalli and then getting into the Hemavati Valley where again 4 miles of construction will be saved if the "Malnad Railway" referred to in para 3 ever comes into being—as the last 4 miles into Mudgere on the Chikmagalur-Mudgere Railway will also be common to the Malnad Railway.

5. The estimated cost of the Railway by the route followed in 1914 was Rs. 58,566 per mile against Rs. 64,394 by the route now proposed, but the rates for earthwork allowed in the 1914 estimate would have to be increased if that project was now accepted and it is believed that the cost, after revision to suit present conditions, will not fall far short of the Rs. 64,394 now estimated.

Scope of the Survey.

6. The survey upon which this estimate is based was a detailed theodolite survey from Kadurhalli to Karagada. From Karagada to Chikmagalur the first 8 miles of the 1914-15 Chikmagalur-Hassan survey has been utilised as no important improvements are proposed. The necessary change in distances on account of the direction being reversed has been made and the plan and section of this length absorbed into the present scheme. Between miles 21·00 and 27·00 where the country is very broken and hilly the estimate is prepared on a paper location.

Geographical Details.

7. From Kadurhalli to mile 12 the line runs through cultivated land with easy gradients and flat curves and with light earthwork. From mile 12 to mile 20 the line is on the slope of a low range of hills—having crossed from one side to the other over the Kanivehalli Pass (referred to in para 4) in mile 17. The earthwork in this section is heavy as the hill sides are evidently composed of hard material. Then from mile 20 to mile 27 the country is very rough with heavy earthwork and much curvature. From mile 27 to 38 the country is easier and cheaper than the first section to mile 12. From this brief description, it will be seen that 23 miles is in light, 7 in heavy and 9 in very heavy country.

8. Chikmagalur is an important town with 9,000 inhabitants and is situated on the edge of the Malnad region of the State. Its rainfall is 36 inches per annum, that of Kadur being 22 inches. It has long been recognised that Railway communication to it is an urgent necessity and has already been too long delayed. The Malnad of Mysore is rapidly becoming depopulated and better

communications are recognised as the first step in its revival. Although the branch line joins the main line at Kadurhalli the real junction will be Birur, Kadurhalli being only a signalling station to allow the branch line trains to enter on and leave the main line. By the time the line is built the Mysore Railways will have running powers on the Arsikere-Birur Section of the main line in order to run through trains from Mysore to Shimoga *via* Hassan. The distance from the point of junction at Kadurhalli to Birur is 5 miles.

II. GAUGE, LENGTH, FIXED POINT, LEVELS GRADIENTS AND CURVES.

Gauge.

9. The estimate is for a metre gauge line but see paras 42—46.

Length.

10. As already stated the length from Kadurhalli to Chikmagalur is 38·73 miles—this represents the length of new construction. The junction station will be Birur (see para 8). The whole of the line is in the Kadur District. Chikmagalur will be 43·73 miles from Birur, 82 miles from Shimoga and 166 miles from Mysore *via* Hassan.

Levels.

11. The datum to which levels are referred is the mean Sea Level as adopted by the Survey of India.

Gradients.

12. The Ruling Gradient is 1 in 100 or 1 per cent compensated on curves at the rate of 0·03 per cent per degree. The branch line represents one engine run.

Curves.

13. In 33 miles of easy and heavy country the sharpest curve used is 5° (radius 1,146 feet). In the 6 miles of very heavy country 12 curves of 17° (radius 337 feet) are located with a few others of 8°, 10° and 15°. The frequent use of the maximum curvature permitted was found to be advisable in this section in order to reduce earthwork. The minimum length of tangent between reverse curves is 250 feet.

III. LOCATION.

14. For estimating purposes the whole length is retained as one section. Although the Mudgere Branch will take off at Karagada at mile 29·79, the whole line up to Chikmagalur will be built as one section and hence there is no object to be gained in dividing it up into two or more sections. From Kadurhalli the line follows the Veda up to Sakkarapatna (mile 8); it then rises steadily on the slopes of the small range of hills to the Kanivehalli Pass, which is an obligatory point and 400 feet lower than the pass used in the 1914 survey. It is claimed that this is correct alignment for any railway connecting Chikmagalur with the main line; (the 1914 route will give an unsatisfactory scheme with small capacity). The line leaves the watershed of the Vedavati for that of the Yagachi when it crosses the Kanivehalli Pass; it then undulates through the very rugged country round about Khalaspur for 6 miles till it again reaches the easy country and runs up the Yagachi valley to Chikmagalur.

15. The question of the junction has already been referred to in paras 8 and 1. There will be no regular station at Kadurhalli as Kadur is only 2½ miles distant. A signaller will be located at this place working under the Station Master at Kadur.

Third Class Stations are proposed at Sakkarapatna Road (8·09), Khalsapur (20·53) and Karagada (29·79) with Flag Stations at Brahmasamudra (3·22) Byadarhalli (12·05), Sadarhalli (15·38), Magadi (33·82). A II Class Station will be required at Chikmagalur. Birur will be a Watering Station and further watering facilities are proposed at Sakkarapatna Road (8·09), Kalsapur (20·53) and Chikmagalur (38·73). Goods sheds are provided at Sakkarapatna Road, Kalsapur, Karagada and Chikmagalur. An Engine shed is provided at Chikmagalur.

16. Separate provision is not made for junction arrangements at Birur as there will be ample accommodation in the way of engine sheds and sidings when trains run from Mysore to Shimoga instead of being made up there.

IV. ALTERNATIVE ROUTES AND EXTENSIONS.

17. The only alternative route suggested is that surveyed in 1914 and the advantages of the present route over that one have been clearly stated in paras 14, 1 & 4.

In 1914 the extension of the line by the Yagachi valley to Hassan was contemplated, but this has since been abandoned in favour of other projects as related in para 3. The Railway to Mudgere will branch off at Karagada (29·79) see para 4. The route proposed *via* the Kudlur and Hemavati valleys is the only feasible alignment for a Railway to Mudgere. It has been reconnoitred and a preliminary report has been submitted but the detailed survey is not yet sanctioned.

V. RELATIONS WITH THE PUBLIC AND WITH THE MILITARY AND OTHER GOVERNMENT DEPARTMENTS

18. There are no military cantonments buildings, rifle ranges or camping grounds on the route.

The bridges will be of the standard needed for many metre gauge traffic but are not intended for heavy guns nor as they ever likely to be required to carry these.

Third class waiting sheds will be given at each III Class Station and I and II class Waiting Rooms at Chikmagalur. The local civil authorities have not been consulted regarding this as the requirements are well known to this department. There will be no interference of religious edifices or sacred places.

VI. CONSTRUCTION AND ENGINEERING

Standard Proposed

19. The standard proposed is that of the Mysore-Arsikere Railway lately completed but with 40 lb. rails instead of 50 lbs. as the traffic is expected to be much less

CONSTRUCTION

Preliminary Expenses.

20. The savings of the 1918 survey estimate are sufficient for finally staking out the line

Land

21. Where the line runs in cultivated land 16 acres per mile has been taken for purposes of calculating the amount of compensation, the rates for which have been obtained from the local civil authorities.

Formation.

22. Formation width of banks is 14 feet with 1½ to 1 side slopes and of cuttings 16 feet inclusive with 1 to 1 side slopes. Turfing of banks is not provided. Ten per cent has been added for repairing banks during construction. A top dressing of 10 cubic feet per foot run of selected material to be supplied by ballast train is provided for all banks at Rs. 20 per 1,000 cubic feet. Maintenance charges during construction and miscellaneous charges are allowed at Rs. 100 and 200 per mile approximate. Side and catchwater drains are provided for all cuttings.

Bridge Work

23. There are no major bridges. The largest bridges are 2 spans of 20 feet arches and 2 spans of 20 feet girders. The number of lineal feet of waterway per mile is.—The types will be the same as on the Mysore-Arsikere Railway. No difficulties are contemplated as materials are available near at hand. On

Gauge 3'-3⅜ **KADUR-CHIKMAGALUR RAILWAY.** 28·82 Miles.

VII. Permanent Way.

Estimated cost of one mile Ballast.

Items	Rate	Per	Quantity Units	Cost
	Rs. a. p.			Rs.
(*a*) Ballast delivered at 10 c. ft. per foot run...	4 0 0	100 c. ft.	528	2,112
Putting the same on track	0 12 0	,,	528	396
Total ...	...	...	...	2,508
Contingencies at 5 per cent	...	...	...	125
Total Ballast for main line per mile ...	...	...	...	2,633
(*b*) Sidings in yards—				
Ballast delivered in yard at 8 c.ft. per foot run	4 0 0	100 c. ft.	422·4	1,689
Putting the same on track ..	0 12 0	,,	422·4	317
Total ..	...	...	...	2,006
Contingencies at 5 per cent	...	...	...	100
Total ballast for sidings per mile ...	...	...	...	2,106

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VIII. Stations and Buildings

(a) *Station and Offices.*

Items	Whole line 28·82 miles			Kadur-Heeragavaja Section 17·11 miles			Heeragavaja-Veeranakanave Section 7·80 miles	Veeranakanave-Chikmagalur Section 3·91 miles
	Cost excluding junction	Cost of junction	Cost including junction	Kadur junction	Brahmasamudra III Class	Sakrepatna	Heeragavaja III Class	Chikmagalur II Class
	Cost	Cost	Cost	Cost	Cost	Cost	Cost	Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Station building	22,500		22,500		3,500	3,500	3,500	12,000
Passenger platform	3,000		3,000		500	500	500	1,500
Wire fencing on platforms	2,000		2,000		500	500	500	500
Road approaches	700		700		100	200	100	300
Latrine	1,600		1,600		400	400	400	400
Goods shed	4,500		4,500			1,000	....	3,500
Goods platforms	2,100		2,100			500	....	1,600
Station hydrant and piping	500		500		..	..	250	250
Station name boards	600		600		150	150	150	150
Lamps on platforms	800		800		200	200	200	200
Wooden palisade fencing with gates	1,000	..	1,000	..	250	250	250	250
Police office and lock-up	..	1,500	1,500	1,500				
Total	39,300	1,500	40,800	1,500	5,600	7,200	5,850	20,650
Contingencies at 5 per cent	1,965	75	2,040	75	280	360	292	1,033
				1,575	5,880	7,560		
Grand total	41,265	1,575	42,840		15,015		6,142	21,683
Rate per mile	1,432	54	1,486		877		787	5,545

KADUR-CHIKMAGALUR RAILWAY

VIII. Stations and Buildings.

(b) Workshops and Store buildings.

Particulars	Rate per mile	Excluding junction								Junction arrangement
		Whole line		Kadur-Heeragavaja Section		Heeragavaja-Veerana-kanave Section		Veeranakanave-Chik-magalur Section		
		Mile	Amount	Mile	Amount	Mile	Amount	Mile	Amount	
	Rs.		Rs.		Rs.		Rs.		Rs.	
Workshop and Stores	400	28·82	11,528	17·11	6,844	7·80	3,120	3·91	1,564	
Grand total ..	..	..	11,528	..	6,844	..	3,120	..	1,564	

Rate per mile Rs. 400.

VIII. Stations and Buildings.

(c) *Staff Quarters.*

Items	Whole line 28·82 miles			Kadur-Heragavaja Section 17·11 miles			Heragavaja-Veerana-kanave Sectoin 7·80 miles	Veeranakanave-Chik-magalur Section 3·91 miles
	Cost excluding Junction	Cost of Junction	Cost including Junction	Kadur Junction	Brahma-samudra III Class	Sakrepatna	Heragavaja III Class	Chikmagalur II Class
	Cost	Cost	Cost	Cost	Cost	Cost	Cost	Cost
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Permanent Way Inspector	3,500		3,500		..	..		3,500
Assistant Permanent Way Inspector	2,600		2,600		..	2,600		..
Trollymen	3,000		3,000		..	1,500		1,500
Gang huts on line with wells	14,300		14,300		4,000	4,000	4,200	2,100
Rest house	8,000		8,000		..	..		8,000
Running room for Guards and Drivers	5,000		5,000		..	..	..	5,000
Station Master	11,300	..	11,300		2,600	2,600	2,600	3,500
Signallers, Clerks and Firemen, etc.	3,600	10,800	14,400	10,800				3,600
Guards	..	5,400	5,400	5,400				
Loco. Foreman	..	4,000	4,000	4,000				
Drivers	..	4,600	4,600	4,600				
Traffic menials	7,000	2,000	9,000	2,000	1,500	1,500	1,500	2,500
Loco menials	..	7,500	7,500	7,500	..	..	..	..
Police Sub-Inspector	..	2,600	2,600	2,600	..	..	..	..
Police constables	2,800	1,200	4,000	1,200	600	600	600	1,000
Staff wells	2,000	500	2,500	500	500	500	500	500
Roads to Staff Quarters	..	1,000	1,000	1,000				..
Total	63,100	39,600	1,02,700	39,600	9,200	13,300	9,400	31,200
Contingencies at 5 per cent	3,155	1,980	5,135	1,980	460	665	470	1,560
				41,580	9,660	13,965		
Grand total	66,255	41,580	1,07,835		65,205		9,870	32,760
Rate per mile	2,299	1,443	3,742		3,811		1,278	8,380

APPENDIX A.

KADUR-CHIKMAGALUR RAILWAY PROJECT OF 1918-19.

NOTE ON RATES.

Preliminary Expenses.

1. The former survey cost Rs. 15,508 according to the Project Estimate f 1914. The sanctioned estimate for the resurvey of 1918 amounts to Rs. 7,929, he savings on which will be sufficient to meet the cost of finally staking out he line.

Land.

2. The rates of compensation were obtained from the local revenue uthorities. Fifteen per cent has been added for the compulsory acquisition of uch land as happens to be under crop when it is required for construction vork. Rs. 80 per mile is provided for the cost of the establishment engaged on cquisition, which is equivalent to about Rs. 10 per acre.

Formation.

3. The rates have been carefully worked out after much thought. The ninimum rate for banks of 5 feet in soft soil is Rs. 5 per 1,000 cubic feet. The ate is increased to Rs. 6 for Banks of 10 feet in soft soil and to Rs. 7 and Rs. 8 or banks of 20 feet and 30 feet. These rates are inclusive, that is, Rs. 8 is provided for the whole of a 30 feet bank in soft soil from zero to the top. In hard soil the rates are respectively Rs. 3, Rs. 4, Rs. 5 and Rs. 6 higher than the above. In the heavy country beyond Kalaspur in miles 21-28 where some banks can only be built with earth trollied out from cuttings the rates allowed are Rs. 12, Rs. 14 and Rs. 15 respectively for banks of 10, 20 and 30 feet. For cuttings in soft and hard soil the rates are approximately 40 per cent higher than for Banks. Where boulders are located an all round rate of Rs. 20 is allowed. For crowbar work Rs. 25 is allowed and for blasting by powder and dynamite the rates are Rs. 70 and Rs. 100. The rates for drains and earthwork in station yards are on the same scale.

The above rates are higher than on the Mysore-Arsikere Railway on account of rise in wages of labour and the price of tools.

Miscellaneous charges at about Rs. 100 per mile and Maintenance charges at about Rs. 200 per mile are allowed.

The top dressing of selected material for banks to be delivered by Ballast train is provided at Rs. 20 per 1,000 cubic feet.

Bridge Work.

4. The lump sum cost of each individual bridge figuring in the estimate was arrived at after comparing the type of bridge, height of formation, etc., with similar structures on the Mysore-Arsikere Railway.

Fencing.

5. Only one mile of wire fencing in the Chikmagalur Station and at the signal station at Kadurhalli is provided Rs. 1,500 is allowed for this.

II class level crossings with small gate lodges, etc., are estimated at Rs. 850 each which is ample as the type need not be so elaborate as on the Mysore-Arsikere Railway. III class level crossings without lodges are estimated at Rs. 200 each.

Ballast and Permanent Way.

6. As the War is over and prices likely to drop to nearly normal before this line is constructed the price of rails is taken at 25 per cent more than the normal Pre-War Price. Similarly for fastenings.

Mysore teak sleepers are estimated at Rs. 4 each. Recently the price was said to be Rs. 6-8-0 each but this was on account of the great demand for sleepers for War purposes and the shortage of labour to supply them. It would be wrong to enter this rate considering the outside demand is decreasing and the supply in this case is from one department to another.

Broken stone ballast is very plentiful over long stretches of the line and Rs. 3 per 100 cubic feet is allowed.

Stations and Buildings.

7. Permanent station buildings and staff quarters costing the same as those built on the Mysore-Arsikere Railway are provided at the II and III class stations, and temporary sheds and quarters at the flag stations. As the cost of the various items under Station machinery varies from month to month, liberal lump sum provisions are made.

Plant.

8. Lump sum provisions are made as it is not possible to prepare a detailed list of articles likely to be required with any accuracy.

Rolling Stock.

9. Sufficient Rolling Stock for one train to run from Birur to Chikmagalur and back daily with spares is provided at rates far in advance of Pre-War Rates but somewhat lower than the rates that have recently prevailed.

General Charges.

10. The cash expenditure on works being about Rs. 7 lakhs a period of 24 months is allowed for completion. This gives an average monthly expenditure of about Rs. 30,000 for a Division with 2 Sub-Divisions which are provided for in this estimate.

H. D. RICE,

Superintending Engineer,
Mysore Railway Surveys.

26th February 1919.

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KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'-3⅜". Length 38·73 Miles.

General Abstract of Cost.

No.	Head of Account	Sub head		Main head	
		Amount	Rate per mile	Amount	Rate per mile
		Rs.	Rs.	Rs.	Rs.
I	**Preliminary Expenses**		-	23,437	605
	(a) Survey expenses	5,642	-	-	-
	(b) Plant	3,117	-	-	-
	(c) Establishment	14,678	-	-	-
II	**Land**	-	-	81,897	2,115
III	**Formation**	-	-	4,93,922	12,753
	(a) Earthwork	4,73,867	-	-	-
	(b) Tunnels	-	-	-	-
	(c) Walling	-	-	-	-
	(d) Side drains	20,055	-	-	-
IV	**Bridge Work**	-	-	1,62,620	4,199
	(a) i. Bridges costing above Rs. 500	51,000	1,317	-	-
	(b) ii. Minor Bridges costing below Rs. 500	1,11,620	2,882	-	-
V	**Fencing**	-	-	20,135	520
	(a) Fencing	7,949	-	-	-
	(b) Road crossings	8,820	-	-	-
	(c) Mile and Gradient Posts	3,366	-	-	-
VI	**Electric Telegraph**	-	-	-	-
VII	**Ballast and Permanent Way**	-	-	9,98,285	25,775
	(a) Main line i. Permanent way	8,59,419	-	-	-
	(a) Main line ii. Ballast	61,348	-	-	-
	(b) Sidings i. Permanent way	63,020	-	-	
	(b) Sidings ii. Ballast	3,598	-	-	
	(c) Points and Crossings	10,900	-	-	-
VIII	**Stations and Buildings**	-	-	1,68,302	4,346
	(a) Station and Office	46,652	1,205	-	-
	(b) Workshops, etc.	-	-	-	-
	(c) Staff Quarters	52,400	1,353	-	-
	(d) Station Machinery	69,250	1,788	-	-
IX	**Plant**	-		43,375	1,120
	(a) Engineering	3,873	100	-	-
	(b) Construction	15,492	400	-	-
	(c) Locomotive	11,619	300	-	-
	(d) Carriage and Wagon	7,746	200	-	-
	(e) Station and Office furniture	4,645	120	-	-
X	**Ferries**	-	-	-	-
XI	**Rolling Stock**	-	-	3,54,000	9,140
	(a) Locomotive	90,000	-	-	-
	(b) Carriage and Wagon	2,64,000	-	-	-
	(c) Motors	-	-	-	-
XII	**General Charges**	-	-	1,47,994	3,821
	(a) Direction	14,525	-	-	-
	(b) Engineering	1,09,880	-	-	-
	(c) Stores	9,167	-	-	-
	(d) Audit and Accounts	7,262	-	-	-
	(e) Medical and Sanitation	7,160	-	-	-
	Total	-	-	24,93,967	64,394

Rate per mile Rs. 64,394.

26th February, 1919.

H. D. RICE
Superintending Engineer,
Mysore Railway Surveys.

DETAILED ESTIMATES.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜"

Length 38·75 miles

I. Preliminary Expenses.

Abstract Estimate.

Sub-head	Survey of 1914	Final Survey of 1918	Total
	Rs.	Rs.	Rs.
Survey Expenses	2,942	2,700	5,642
Plant ...	1,978	1,139	3,117
Establishment ...	10,588	4,090	14,678
Total ...	15,508	7,929	23,437

Rate per mile Rs. 605

The savings on survey of 1918 will be sufficient for final location.

II. Land.

Abstract Estimate.

Description of land	Area in acres	Rate per acre	Amount
	Rs.	Rs.	Rs.
Chikmagalur Town Lands	19	1,000	19,000
Compensation for houses at Chikmagalur ...		L. S.	5,000
Garden land ...	3	1,000	3,000
Mango tope ...	1·5	500	750
Irrigated land I kind ...	20	300	6,000
Do II „ ...	33	200	6,600
Do III „ ...	12	100	1,200
Unirrigated land I kind ...	12	150	1,800
Do II „ ...	64	120	7,680
Do III „ ...	82	100	8,200
Do IV „ ...	62	75	4,650
Do V „ ...	15	50	750
Compensation for trees and huts, etc.		L. S.	500
Extra for compulsory acquisition at 15 per cent ...		...	9,769
Establishment for acquisition of land at Rs. 80 per mile		Rs. 80 per mile	3,098
Total			77,997
Contingencies at 5 per cent			3,900
Grand Total			81,897

Rate per mile Rs. 2,115.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3$\frac{3}{8}$" **Length 38·73 Miles.**

III. Formation.

Items	Quantity	Rate	Unit	Cost
				Rs.
(*a*) *Earthwork* as per statement :—				
,, Bank 23,781,303 c.ft. ..	..	..	..	2,30,289
,, Cutting 10,663,826 c.ft. ..	..	..	..	1,84,589
,, in Station yards ..	..	..	..	4,674
Nalla diversions ..	..	..	L.S.	1,000
Pitching for Banks ..	..	..	L.S.	2,000
Service Road ..	20 Miles	100	Mile	2,000
Jungle clearing ..	15 ,,	50	Mile	750
Miscellaneous charges ..	..	..	L.S.	4,000
Maintenance charges during construction ..	..	..	L.S.	7,000
Top dressing for bank at 10 c.ft. per foot run.	1,100,000	20	1,000	22,000
Contingencies at 5 per cent. ..	..	..	..	22,565
Total ..	..	..	..	4,73,867
	..	..	..	..
(*b*) *Tunneling* ..	Nil	..	..	..
(*c*) *Walling* ..	Nil	..	..	..
(*d*) *Side drains* ..	..	..	..	..
Catch drains ..	1,685,000	8	1,000	13,480
Side drains in cuttings ..	5,62,000	10	1,000	5,620
Contingencies at 5 per cent ..	..	..	..	955
Total ..	..	..	..	20,055
Total main head ..	..	..	..	4,93,922

Rate per mile Rs. 12,753.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'-3⅜" Length 38·73 Miles.

Statement of Earthwork.

Items	Quantity	Rate	Per	Amount
Earthwork—	C. ft.	Rs	C. ft.	Rs.
(*a*) For Bank. 0 to 5 ft. Soft Soil ..	2,168,964	5	1,000	10,845
0 to 10 ,, ,, ..	2,069,645	6	1,000	12,418
0 to 20 ,, ,, ..	4,684,275	7	1,000	32,790
0 to 30 ,, ,, ..	2,451,196	8	1,000	19,609
0 to 5 ,, Hard Soil..	834,971	8	1,000	6,680
0 to 10 ,, ,,	1,368,025	10	1,000	13,680
0 to 20 ,, ,,	4,763,414	12	1,000	57,161
0 to 30 ,, ,,	1,583,995	14	1,000	22,176
0 to 10 ,, Special	480,017	12	1,000	5,760
0 to 20 ,, ,,	1,481,311	14	1,000	20,738
0 to 30 ,, & above	1,895,490	15	1,000	28,432
Total Bank	23,781,303			2,30,289
(*b*) For cutting 0 to 5 ft. Soft Soil	1,709,823	7	1,000	11,969
0 to 10 ,, ,,	816,652	8½	1,000	6,942
0 to 20 ,, ,,	84,615	10	1,000	846
0 to 5 ,, Hard soil..	2,383,503	9	1,000	21,452
0 to 10 ,,	1,502,964	12	1,000	18,036
0 to 20 ,,	1,222,377	15	1,000	18,336
Earth mixed with boulders	60,792	20	1,000	1,216
Crowbar work	2,150,589	25	1,000	53,765
Powder work	707,468	70	1,000	49,523
Blasting rock	25,043	100	1,000	2,504
Total cutting	10,663,826			1,84,589

Stations	Bank	Rate	Amount	Cutting	Rate	Amount	Total
		Rs.	Rs.		Rs.	Rs.	Rs.
Kadurhalli ..	60,000	6	360	...		...	360
Bhramasamudra ..	6,000	6	36	28,000	8	224	260
Sakkarepatna ..	8,000	6	48	80,000	8	640	688
Byadarahalli ..	40,000	6	240	57,000	8	456	696
Sadarahalli ..	53,000	6	318	8,000	8	64	382
Kalasapur ..	54,000	8	432	77,000	10	770	1,202
Karagada ..	11,000	6	66	30,000	6	180	246
Magadi ..	2,000	6	12	61,000	6	366	378
Chikmagalur ..	77,000	6	462		..	...	462
Total ..		...			...	...	4,674

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles.**

IV. Bridges—(Minor).

Bridges costing above Rs. 5,000.

No.	Chainage	Miles	Catch-ment in Miles	Discharge	Velocity	Water way Reqd.	Height of Bank	Bridge prvd.	Water way prvd.	Cost
										Rs.
10	37,400	7·08	16·00	4,128	8	516	33	2×20 Arch	600	9,000
17	61,000	11·55	4·00	1,808	8	226	24	1×20 Arch	240	5,000
45	112,000	21·21	4·00	1,808	8	226	24	2×20 Arch	240	8,000
60	131,700	24·94	2·00	1,290	7	184	42	1×20 Arch	200	5,000
77	165,100	31·26	4·00	1,808	7	258	12	2×20 Girder	260	6,000
93	185,700	35·15	5·00	1,935	8	242	13	2×20 Girder	260	6,000
97	192,100	36·38	3·00	1,548	8	193	8	2×20 Girder	200	6,000
103	200,000	37·87	6·00	1,938	8	242	11	2×20 Girder	260	6,000
								Total Rs. ..		51,000

Average per mile Rs. 1,317.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles.**

IV. Bridges (Minor).

Costing under Rs. 5,000

No.	Chainage	Miles	Catchment	Discharge	Velocity	Water way Reqd.	Ht. of Bank	Bridge prvd.	Water way prvd	Cost
										Rs.
1	500	·09			..	...	6·26	1x4' Salb top		800
2	1,600	·34	1·00	807	8	101	5·38	10x2' Open	107	3,000
3	8,500	1·60	2·50	1,290	8	161	10·24	2x12' Girder	168	4,000
4	13,900	2·63	...	...	..	...	3·84	3x2' Open		640
5	19,800	3·75	4·50	1,741	8	218	14·42	2x12' Girder		4,500
6	21,400	4·08	...	...	..	...	12·46	1x4' Slab		1,000
7	24,100	4·56	...	...	..	....	15·74	2x4' Slab		2,000
8	25,400	4·81	1·50	968	8	121	17·05	1x20' Girder		3,500
9	34,300	6·49	1·00	807	8	516	6·00	1x20' Girder		3,000
11	38,300	7·25					10·51	1x4' Slab		1,000
12	44,000	8·33					14·28	1x20' Girder		4,500
13	47,000	8·90					4·76	2x2' Open		640
14	50,000	9·47					14·34	2x4' Slab		2,000
15	53,300	10·15					9·48	1x4' Slab		1,000
16	57,700	10·93					2·35	2x2' Open		500
18	64,000	12·12					8·65	2x4' Slab		2,000
19	68,000	12·87					15·35	2x4' Slab		2,000
20	70,000	13·25					27·59	1x10' Arch		3,000
21	72,200	13·67					9·32	2x4' Slab		2,000
22	74,200	14·05					6·52	1x4' Slab		800
23	75,800	14·35					13·44	1x4' Slab		1,000
24	77,800	14·73					19·17	2x4' Slab		2,000
25	78,400	14·83					18·38	2x4' Slab		2,000
26	81,500	15·43					6·35	2x2' Open		640
27	83,300	15·75					17·27	1x4' Slab		1,500
28	84,400	15·98					19·20	1x4' Slab		1,500
29	86,400	16·36					17·07	2x4' Slab		2,000
30	88,000	16·66					8·99	1x2' Slab		500
31	89,400	16·95					14·03	1x12' Girder		2,400
32	94,200	17·84					2·43	3x2' Open		960
33	95,700	18·12					6·49	1x4' Slab		800
34	96,800	18·33					9·24	2x2' Open		640
35	97,700	18·52	...	...	...	...	10·58	1x4' Slab		1,000
36	102,000	19·31	1·50	968	·8	121	35·69	1x15' Arch		3,500
37	103,600	19·62					23·18	2x4' Slab		2,000
38	104,900	19·84					11·74	1x4' Slab		1,000
39	105,500	19·98					4·97	1x2' Open		200
40	106,600	20·28					21·77	2x4' Slab		2,000
41	108,400	20·53					8·38	2x4' Slab		1,500
42	110,500	20·92					5·75	2x2' Open		500
43	111,100	21·04					0·50	1x2' Open		150
44	111,600	21·13					0·50	1x2' Open		150
46	113,200	21·43					4·50	2x2' Open		400
47	113,800	21·55					18·50	1x4' Slab		1,250
48	115,000	21·78					21·00	1x4' Slab		1,500
49	116,400	22·04					15·00	1x4' Slab		1,000
50	117,500	22·25					14·00	1x4' Slab		1,000
51	118,500	22·44					12·00	1x2' Open		600
52	119,900	22·78					12·00	1x4' Slab		1,000
53	121,700	23·04					10·50	1x4' Slab		1,000
54	123,400	23·37					10·70	1x2' Slab		600
55	124,900	23·65					11·70	1x4' Slab		1,000
56	126,800	24·01					8·70	1x2' Slab		600
57	128,600	24·37					3·70	1x2' Open		250
58	129,000	24·43					5·70	1x2' Slab		500
59	129,800	24·58					0·70	1x2' Open		150
61	133,500	25·28					11·72	1x4' Slab		1,000

IV. Bridges (Minor).—*contd.*

No.	Chainage	Miles	Catchment	Discharge	Velocity	Water way Reqd.	Ht. of Bank	Bridge prvd.	Water way prvd.	Cost
										Rs.
62	134,400	25·45	..	..	..	..	12·00	1x3′ Slab	..	1,000
63	136,600	25·87	..	..	..	..	4·00	1x2′ Slab	..	600
64	137,400	26·02	..	..	..	..	5·66	1x2′ Open	..	300
65	137,900	26·11	..	..	..	..	9·00	1x2′ Slab	..	500
66	139,400	26·40	..	..	..	..	19·00	1x4′ Slab	..	1,200
67	142,800	27·04	..	..	..	..	16·00	1x4′ Slab	..	1,000
68	144,400	27·35	..	..	..	..	8·37	1x2′ Slab	..	600
69	146,200	27·69	..	..	..	..	14·67	1x4′ Slab	..	1,000
70	147,000	28·01	..	..	..	..	2·34	4x2′ Open	..	800
71	151.000	28·59	..	..	..	..	6·15	4x2′ Open	..	1,200
72	154,300	29·22	..	..	..	..	7·15	1x4′ Slab	..	1,000
73	156,700	29·67	..	..	..	..	1·79	2x2′ Open	..	400
74	158,300	29·98	..	..	..	..	4·31	2x2′ Open	..	600
75	161,800	30·64	1	807	8	101	5·55	10x2′ Open	110	3,000
76	163,600	31·00	2	1,290	7	184	10·39	2x15′ Girder	195	4,500
78	166,000	31·44	..	..	..	..	2·03	Irrigation	..	200
79	167,000	31·62	..	..	..	..	0·75	Irrigation	..	150
80	168,000	31·81	..	..	..	..	7·97	1x4′ Slab	..	800
81	168,900	31·99	..	..	..	..	0·64	Irrigation	..	150
82	169,300	32·06	..	..	..	..	3·16	Irrigation	..	200
83	169,800	32·15	..	..	..	..	5·17	Irrigation	..	300
84	170,300	32·25	..	..	..	..	7·34	Irrigation	..	300
85	171,100	32·45	..	..	..	..	9·02	Irrigation	..	300
86	171,450	32·48	..	..	..	..	1·43	Irrigation	..	300
87	179,800	34·05	..	..	..	..	4·72	1x4′ Slab	..	500
88	180,300	34·14	..	..	..	..	15·95	2x3′ Slab	..	1,500
89	181,700	34·41	..	..	..	..	12·50	1x4′ Slab	..	1,000
90	182,600	34·58	..	..	..	..	6·54	1x4′ Slab	..	800
91	184,100	34·86	..	..	..	..	0·09	1x2′ Open	..	200
92	185,100	35·05	..	..	..	..	9·06	1x4′ Slab	..	1,000
94	186,200	35·26	..	..	..	..	5·08	1x4′ Slab	..	800
95	189,100	35·81	..	..	..	..	2·00	1x2′ Open	..	500
96	191,700	36·30	..	..	..	..	5·94	1x2′ Slab	..	500
98	194,000	36·74	..	..	..	..	2·06	3x2′ Open	..	600
99	195,900	37·10	..	..	..	..	1·98	Irrigation	..	150
100	196,500	37·21	..	..	..	..	1·81	1x2′ Open	..	250
101	198,100	37·51	..	..	..	..	0·42	1x2′ Open	..	250
102	198,600	37·61	..	..	..	..	3·58	5x2′ Open	..	1,500
										1,11,620

Average per mile Rs. 2,882.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'-3⅜" **Length 38·73 Miles.**

V. FENCING, ETC.

Particulars	Quantity	Rate	Per	Amount	Total amount of sub-head
(*a*) *Fencing.*	Miles	Rs.		Rs.	Rs.
Wire fencing around Chikmagalur and Kadurhalli Station yards.	1	1,500	Mile	1,500	
Aloe fencing at Level crossings and near villages close to line.	6	150	Mile	900	
Demarcation stones at 30 per mile...	1,170	1	Each	1,170	
Hedges along the boundary	L. S.			4,000	
Total fencing				7,570	
Add 5% contingencies				379	7,949
(*b*) *Road Crossings.*					
II Class Level crossings with gate lodges.	4	850		3,400	
III Class Level crossings without gate lodges.	25	200		5,000	
Total Road Crossings				8,400	
Add 5% contingencies				420	8,820
(*c*) *Mile and Gradient Psts*					
Mile Posts	39	6	Each	234	
Gradient Posts	110	10		1,100	
Plates for numbering Telegraph Posts at 24 per mile.	936	2		1,872	
Total Mile and Gradient Posts				3,206	
Add 5% contingencise				160	3,366
Grand Total					20,135

Cost per mile Rs. 520.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'-3⅜"

Length 38·73 Miles.

Level Crossings.

Class	No.	Chainages	Mileage	Cost	Remarks
II	1	40,300	7·63		
,,	2	132,350	25·06		
,,	3	156,700	29·67		
,,	4	196,400	37·19		
III	5	3,500	0·66		
,,	6	12,000	2·27		
,,	7	21,100	3·99		
,,	8	31,100	5·89		
,,	9	36,600	6·93		
,,	10	46,200	8·75		
,,	11	47,900	9·07		
,,	12	53,500	10·13		
,,	13	62,400	11·81		
,,	14	70,500	13·35		
,,	15	76,100	14·41		
,,	16	82,900	15·70		
,,	17	91,000	17·23		
,,	18	100,200	18·97		
,,	19	116,900	22·14		
,,	20	147,200	27·87		
,,	21	149,000	28·22		
,,	22	152,000	28·78		
,,	23	162,500	30·77		
,,	24	166,500	31·53		
,,	25	171,500	32·48		
,,	26	179.600	34·01		
,,	27	183,500	34·75		
,,	28	188,300	35·66		
,,	29	193,800	36·70		
,,	30	...	..		

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles.**

VII. Ballast and Permanent Way.

Particulars	Quantity	Rate	Per	Amount
	Miles	Rs.		Rs.
(a) Main Line.				
i. Permanent way 40 lbs. B.S.S., F.F. rails on Mysore teak sleepers for 38·73 miles.	38·73	22,190	Mile	8,59,419
ii. Ballast at 10 c.ft. per foot run at Rs. 3 per 100 cubic feet at Rs. 1,584 per mile.	38·73	1,584	,,	61,348
(b) Sidings.				
i. Permanent way 40 lbs. B.S.S., F.F. rails on Mysore teak sleepers for 2·84 miles at Rs. 22,190 per mile.	2·84	22,190	,,	63,020
ii. Ballast at 8 c.ft. per foot run for 2·84 miles at Rs. 1,267 per mile at Rs. 3 per 100 cubic feet.	2·84	1,267	,,	3,598
(c) Points and Crossings.				
40 lbs. material 1 in 12 sets No. 17 at Rs. 500 each.	17	500	Each	8,500
Do 1 in 8½" at Rs. 400	6	400		2,400
Total				9,98,285

Rate per mile Rs. 25,776.

Reference.

Name of station	P.W. in loop	P.W. good's sidings	P.W. Loco. sidings	1 in 12 points	1 in 8½ Crossings
Kadurhalli ..				1	
Bhramasamudra ..	1,000			2	-
Sakkarepatna ..	1,000	600		2	1
Byadurahalli ..	1,000	-		2	-
Sadarahalli ..	1,000	-		2	-
Khalasapur ..	1,900	600		2	1
Karagada ..	1,900	600		2	1
Magadi ..	1,000	-		2	-
hikmagalur ..	1,900	1,000	1,500	2	3
Total ..	10,700	2,800	1,500	17	6
		2·84 miles.			

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3′—3⅜″ **Length 38·73 Miles**

Estimate cost of one mile of Permanent Way with 40 lbs.

B.S.S., F.F. STEEL RAIL WITH TEAK SLEEPERS.

Particulars	Weight in tons	Rate	Amount
		Rs	Rs.
Rails 40 lbs. F.F. 30 feet long	62·85	130	8,171
Fish plates, pairs 365, weight 9·125 lbs. per pair ..	1·49	170	253
Fish bolts with nuts and washers	0·62	400	248
Bearing plates at joints, 365 pairs; 4·5 lbs. per pair ..	0·74	220	163
Spikes	2·45	450	1,103
Total ..	68·15	Tons	9,938
Sea freight at Rs. 15 per ton			1,022
Insurance at ½ per cent			55
English agency charges at 2½ per cent. exclusive of Insurance and Sea freight ..			248
Landing charges and harbour dues at Rs. 3-8 0 per ton			239
Loading in trucks at Madras 4 annas per ton			17
Carriage from Madras to Kadur 347 miles at 3 pies per ton mile			368
Unloading and loading at Bangalore and Kadur Re. 1 per ton			68
Carriage to work site average 20 miles at 2 annas per ton mile			170
Mysore teak sleepers 6′ × 8″ × 6″ 2,000 per mile at Rs. 4 each			8,000
Stacking sleepers at 3 pies each			31
Carriage to work site at 2 annas per ton mile, average 20 miles lead (weight 70 tons per mile).			175
Laying Permanent way			500
Maintenance during construction for 6 months at Rs. 50 per mile per month ..			300
Total ..			21,131
Contingencies at 5 per cent ..			1,057
Grand Total ..			22,188

Say Rupees 22,190 per mile.

VIII. STATIONS AND BUILDINGS.

(a) Stations and Offices.

Particulars	Kadurhalli 0	Bhramasamudra 3·22	Sakkarepatna Road G. W. 8·09	Byadarahalli 12·05	Sadarahalli 15·38	Kalsapur C.W. 20·53	Karagada 29·79	Magadi 33·82	Chikmagalur 38·73	Total
	F.	F.	III	F.	F.	III	III	F.	II	
Station Building II Class with I, II and III Class	..	..	..	..	..	..	..	..	8,000	8,000
Station Building III Class..	..	..	3,500	..	..	3,500	3,500	..	..	10,500
Station Building for Flag Station.	600	600	..	600	600	..	..	600	..	3,000
Goods shed ..	..	..	1,000	..	..	1,000	1,000	..	2,000	5,000
Passenger Platform ..	300	100	500	100	100	1,000	500	100	1,000	3,700
Wire fencing on platforms..	500	500	500	500	500	500	500	500	1,000	5,000
Goods platform ..	..	..	400	..	..	400	400	..	1,000	2,200
Platform latrines ..	..	..	400	..	..	400	400	..	600	1,800
Passenger approach road ..	100	100	200	100	100	200	100	100	200	1,200
Goods approach road ..	..	..	100	..	..	100	100	..	200	500
Station Hydrant and piping..	..	..	250	..	..	250	..	..	400	900
Lamps for platform ..	..	150	150	150	150	150	150	150	200	1,250
P. W. Inspector's Office and Stores.	..	..	..	..	..	..	..	..	800	800
Name Boards ..	60	60	60	60	60	60	60	60	100	580
Total ..	..	..	..	..	..	..	..	..	..	44,430
Add 5 per cent. contingencies	..	..	..	..	..	..	..	..	..	2,222
Grand Total ..	..	..	..	..	..	..	..	..	..	46,652

Rate per mile Rs. 1,205.

Gauge 3'-3⅜"

KADUR-CHIKMAGALUR RAILWAY.

VIII. Stations and Buildings.

Abstract Estimate—(c) Staff Quarters.

Length 38·73 miles.

Particulars	Kadurhalli		Bhrama-samudra		Sakkarepatna Road		Byadarahalli		Sadarahalli		Kalasapur G. W.		Karagada G		Magadi		Chikmagalur G. W. & T.		Total	
			3·22		G. W. 8·09		12·05		15·38		20·53		29·79		33·82		38·73			
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Traffic—		Rs.		Rs.		Rs.		Rs.		Rs.		Rs		Rs.		Rs.		Rs.		Rs.
Traffic Inspector or A. T. S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2,500	1	2,500
Indian Station Masters' Qrs.	..	..	..	..	1	2,000	..	..	..	..	1	2,000	1	2,000	..	..	1	2,000	4	8,000
Asst. Station Masters' or Signallers' Qrs.	2	2,000	1	1,000	2	2,000	1	1,000	1	1,000	2	2,000	2	2,000	1	1,000	2	2,000	14	14,000
Station menials	2	1,000	1	500	2	1,000	1	500	1	500	2	1,000	2	1,000	1	500	2	1,000	14	7,000
Drinking wells	1	300	1	300	1	500	1	500	1	500	1	500	1	500	1	500	1	500	9	4,600
Locomotive—																				
Clerks, Shunters and Fireman																	4	2,500	4	2,500
Menials																	4	2,000	4	2,000
Fitters (Indian)																	2	1,000	2	1,000
Engineering—																				
Permanent Way Inspectors' Qrs.											..						1	1,500	1	1,500
Sub-Way Inspectors' Quarters...											1	1,000					1	1,000	2	2,000
Trolley men											3	1,500					6	3,000	9	4,500
Huts for Gang men											..						..			3,000
Police—																				
Office and Lock up																	1	1,000	1	1,000
Sub-Inspector					..	..					..		..	..			1	800	1	800
Constables					1	400					1	400	1	400			2	800	5	2,000
Telegraph—																				
Line men ..			..		..	..					..	..					1	500	1	500

Rate per mile Rs. 1,353.

Total 52,40(

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜"

VIII. Stations and Buildings.

Length 38·73 Miles.

(*d*) Station Machinery.

Particulars	Kadurhalli		Bhrama-samudra		Sakkare-patna		Byadara-halli		Sadarahalli		Kalsapur		Karagada		Magadi		Chikmagalur		Total	
	0		3·22		G. W. 8·09		12·05		15·23		G. W. 20·53		G. 29·79		33·82		G. W. E. T. 38·73			
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
		Rs.		Rs.		Rs		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.
Ash pits ..	..	..	..	..	2	2,000	..	..	..	..	2	2,000	..	..	..	..	3	3,000	7	7,000
Loco well ..	..	..	..	..	1	1,000	..	..	..	..	1	2,000	..	..	..	..	1	1,000	3	4,000
Hand pump with shed ..	..	..	..	..	1	800	..	..	..	..	1	800	..	..	..	..	1	800	3	2,400
Piping ..	..	..	..	..	..	1,000	..	..	..	..	1	1,000	..	..	..	..	1	1,000	..	3,000
Water tank on trestle ..	..	..	..	..	2	2,000	..	..	..	..	2	2,000	..	..	..	..	2	2,000	6	6,000
Water column ..	..	..	..	..	2	1,000	..	..	..	..	2	1,000	..	..	..	..	2	1,000	6	3,000
Weighing machine ..	..	..	1	150	2	350	1	150	1	150	2	350	1	150	1	150	2	350	11	1,800
Buffer stops ..	..	..	..	..	1	50	..	..	..	..	1	50	..	..	..	..	3	150	5	250
Scotch blocks ..	..	..	..	..	1	40	..	..	..	..	1	40	..	..	..	..	3	120	5	200
Point indicators ..	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100	1	50	17	850
Signals ..	1	1,750	2	3,500	2	3,500	2	3,500	2	3,500	2	3,500	2	3,500	2	3,500	1	1,750	16	28,000
Hydrants ..	..	..	..	..	1	250	..	..	..	..	1	250	..	..	..	..	1	250	3	750
Hand crane ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3,000	1	3,000
Engine shed ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3,000	1	3,000
Engine turn table ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6,000	1	6,000
Total ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	69,250

Rate per mile Rs. 1,788.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles.**

VIII. Stations and Buildings.

Items	Rate per mile	Total sub-head
	Rs.	Rs.
(*a*) Stations and Buildings	1,205	46,652
(*b*) Workshops and Stores		
(*c*) Staff Quarters	1,353	52,400
(*d*) Station Machinery	1,788	69,250
Total	4,346	1,68,302

IX. Plant.

Sub-heads	Miles	Rate per mile	Total of sub-head
		Rs.	Rs.
(*a*) Engineering	38·73	100	3,873
(*b*) Construction	,,	400	15,492
(*c*) Locomotive	,,	300	11,619
(*d*) Carriage and Wagon	,,	200	7,746
(*e*) Station and Office furniture	,,	120	4,645
(*f*) Steamers	..		
(*g*) Electric	..		
Total main head		1,120	43,375

Average rate per mile Rs. 1,120.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles**

XI. Rolling Stock.

Sub-heads	No.	Rate	Amount
		Rs.	Rs.
(a) *Locomotives.*			
Passenger N. Class second hand	2	45,000	90,000
(b) *Carriage and Wagon.*			
1st and 2nd Class composite coaches and 3rd Class.	2	20,000	40,000
3rd Class coaches with postal compartments in 2 coaches.	3	20,000	60,000
Brake Vans ..	3	8,000	24,000
Bogie goods covered open and P. L. S. ..	10	6,000	60,000
Four wheelers goods L. S., H. S. and covered.	20	4,000	80,000
(c) Motar Cars ..	...	...	...
Total ..	..	...	3,54,000

Rate per mile Rs. 9,140.

XII. General Charges.

Sub-heads	Amount of sub-head	Rate per mile
	Rs.	Rs.
(a) Direction or General ...	14,525	375
(b) Engineering ...	1,09,880	2,837
(c) Stores ...	9,167	237
(d) Audit and Accounts ...	7,262	188
(e) Medical and Sanitation ...	7,160	184
(f) Locomotive ...	Nil	...
(g) Traffic ...	Nil	...
Total Main Head ...	1,47,994	3,821

KDUR-CHIKMAGALUR RAILWAY

Gauge 3'—3⅜ **Length 38·73 Miles**

XII. General Charges.

Item	No	Rate	Period Months	Amount
		Rs.		Rs.
(a) *Direction*—				
Share of Superintending Engineer's Office ½ per cent on the cost of Railway.				14,525
(b) *Engineering*—				
Executive Engineer ..	1	600	24	14,400
Assistant Engineer ..	2	300	24	14,400
Upper Subordinates ..	2	100	24	4,800
Permanent Way Inspector ..	1	100	12	1,200
Do Sub-Way Inspector ..	2	50	12	1,200
Sub-Overseers ..	9	50	24	10,800
Maistries (25 to 35) ..	12	30	24	8,640
Accountant ..	1	100	24	2,400
Assistant Accountant ..	1	50	24	1,200
Head Clerk ..	1	60	24	1,440
Cashier ..	1	60	24	1,440
Assistant Cashier ..	1	35	24	840
Clerks of Division Office ..	4	30	24	2,880
Do Sub-Divisions ..	2	30	24	1,440
Draughtsman ..	1	50	24	1,200
Tracer ...	1	30	24	720
Peons for Executive Engineer ...	4	10	24	960
Do for others ..	10	10	24	2,400
Sweepers ..	5	3	24	360
Dak runners	7	10	18	1,260
Travelling and Malnad allowances		1,000	24	24,000
Quarters (rent for houses)		300	24	7,200
Do Office		50	24	1,200
Office furniture (depreciation)		...		500
Instruments (do)				2,000
Office Expenses				1,000
Total	...	...		1,09,880
(c) *Stores*—				
Share of Chief Store-Keeper's Office	...	1¼%		7,262
Sub-Store-Keeper	1	45	15	675
Checker	1	20	15	300
Peons	2	10	15	300
Quarters (rent)		15	15	225
Office (rent)		15	15	225
Office Expenses		10	15	150
Office furniture (depreciation)				30
Total	...			9,167
(d) *Audit and Accounts*—				
½ per cent of the total cost of Railway				7,262
(e) *Medical and Sanitation*—				
Sub-Assistant Surgeon	1	80	18	1,440
Compounder	2	15	18	540
Coolies	2	10	18	360
Travelling Allowances		40	18	720
Quarters (rent)		20	18	360
Dispensary and Office (rent)		20	18	360
Instruments (depreciation)			..	1,000
Furniture (do)			..	200
Office Expenses		10	18	180
Medicines		L S.		2,000
Total				7,160
Grand Total				1,40,732

Rate per mile Rs. 3,634.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜" **Length 38·73 Miles**

FORM R. I.

Curve Abstract.

Degree of Curvature or Radius	No. of each	Total length in miles	Total curvature in Degree
17° (R = 337 feet) ..	12	1·27	1,141°—10′
15° (R = 382 ,,) ..	1	0·15	122°—30′
10° (R = 573 ,,) ..	2	0·19	101°—10′
8° (R = 717 ,,) ..	5	0·84	345°—50′
5° (R = 1,146 ,,) ..	4	1·24	327°—40′
4° (R = 1,432·5 ,,) ..	10	2·93	618°—31′— 3″
3° (R = 1,910 ,,) ..	8	2·13	326°—17′—45″
2° (R = 2,865 ,,) ..	11	3·28	345°—42′—23″
1½° (R = 3,820 ,,) ..	1	0·25	20°— 0′
1° (R = 5,730 ,,) ..	3	0·89	47°—10′
	57	13·17	3,396°—1′—11″

Ratio of curve to total length of line 34 per cent.

Average amount of curvature per mile 87·69°.

NOTE:—Curves sharper than 5° are put only in the ghat portion for 6 miles beyond Khalsapur Station.

FORM R. II.

Gradient Abstract.

Inclination	No. of each	Total in miles	Percentage of total length of line
1 in 100 or 1·00 per cent. ..	36	12·15	31·37
1 in 105 or 0·95 ,, ..	1	0·40	1·03
1 in 110 or 0·90 ,, ..	6	2·30	5·94
1 in 112·5 or 0·89 ,, ..	1	0·68	1·75
1 in 115 or 0·87 ,, ..	4	1·34	3·46
1 in 120 or 0·83 ,, ..	7	4·12	10·64
1 in 125 or 0·80 ,, ..	3	0·56	1·45
1 in 133·3 or 0·75 ,, ..	4	1·04	2·68
1 in 150 or 0·66 ,, ..	4	1·37	3·53
1 in 166·6 or 0·60 ,, ..	1	0·60	1·55
1 in 200 or 0·50 ,, ..	13	3·47	8·96
1 in 220 or 0·45 ,, ..	1	0·83	2·14
1 in 250 or 4·40 ,, ..	1	0·19	0·50
1 in 300 or 0·33 ,, ..	2	1·70	4·40
1 in 400 or 0·25 ,, ..	1	0·90	2·32
1 in 500 or 0·20 ,, ..	3	1·04	2·69
1 in 600 or 0·16 ,, ..	1	0·22	0·56
1 in 800 or 0·12 ,, ..	1	0·30	0·77
1 in 1,000 or 0·10 ,, ..	1	0·38	0·98
Flatter than 1,000 including Level ..	17	5·14	13·28
	108	38·73	100·00

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3′—3⅜″ **Length 38·73 Miles.**

FORM R. III.

Bridge Abstract.

Type of Bridge		Total No. of spans	Waterway lineal feet
Class	Span		
Open tops	2	73	146
Slab tops	2	14	28
Do ..	3	3	9
Do ..	4	50	200
Arched culverts ..	10	1	10
Do ..	15	1	15.
Do ..	20	6	120
Girder Bridges ..	12	5	60
Do ..	15	2	30
Do ..	20	11	220
Total ..			838

Average waterway per mile 21·63 Running feet.

FORM R. V.

Stations.

Name of Stations	Class	Chainage	Distance apart	Mileage
Kadurhalli *		0	0.	0
Bhramasamudra ..	Flag	17,000	3·22	3·22
Sakkarepatna Road W. G. ..	III	42,700	4·87	8·09
Byadarahalli ..	Flag	63,600	3·06	12·05
Sadarahalli ..	III	81,200	3·33	15·38
Khalasapura W. G. ..	III	108,400	5·15	20·53
Karagada G. ..	III	157,300	9·26	29·79
Magadi ..	Flag	178,550	4·03	33·82
Chikmagalur W. E. G. T. ..	II	203,520	4·91	38·73

W=Watering Station.
E=Engine shed provided.
G=Goods arrangements provided.
T=Turn Table.
*=Signalling Station.

KADUR-CHIKMAGALUR RAILWAY.

Gauge 3'—3⅜"

Length 38·73 Miles.

FORM R. VI.

Station Machinery.

Name of Station	Station ashpits	Water Column		Pipes		Water tank capacity	Well diameter in feet	Steam pump with shed	Hand pump or water lift with shed	Home signals	Distant signals	Weight bridge		Engine shed area	Loco. ashpits	Engine turn table	Engine lift	Remarks
		No.	Diameter in Inches	Length	Diameter in Inches							No.	Capacity					
Kadurhalli	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Bhramasamudra	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Sakkarepatna Road	2	2	6"	1,400'	6" & 4"	8,000	15'	..	1	..	2	...	..	..	..	..	..	
Byadarahalli	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Sadarahalli	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Kalasapur	2	2	6"	1,400'	6" & 4"	8,000	15'	..	1	..	2	...	..	..	..	..	..	
Karagada	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Magadi	...	...	...	...	...	...	...	..	...	..	2	...	..	..	..	..	..	
Chikmagalur	2	2	6"	1,400'	6" & 4"	8,000	15'	..	1	..	1	...	..	2,040	1	1	..	